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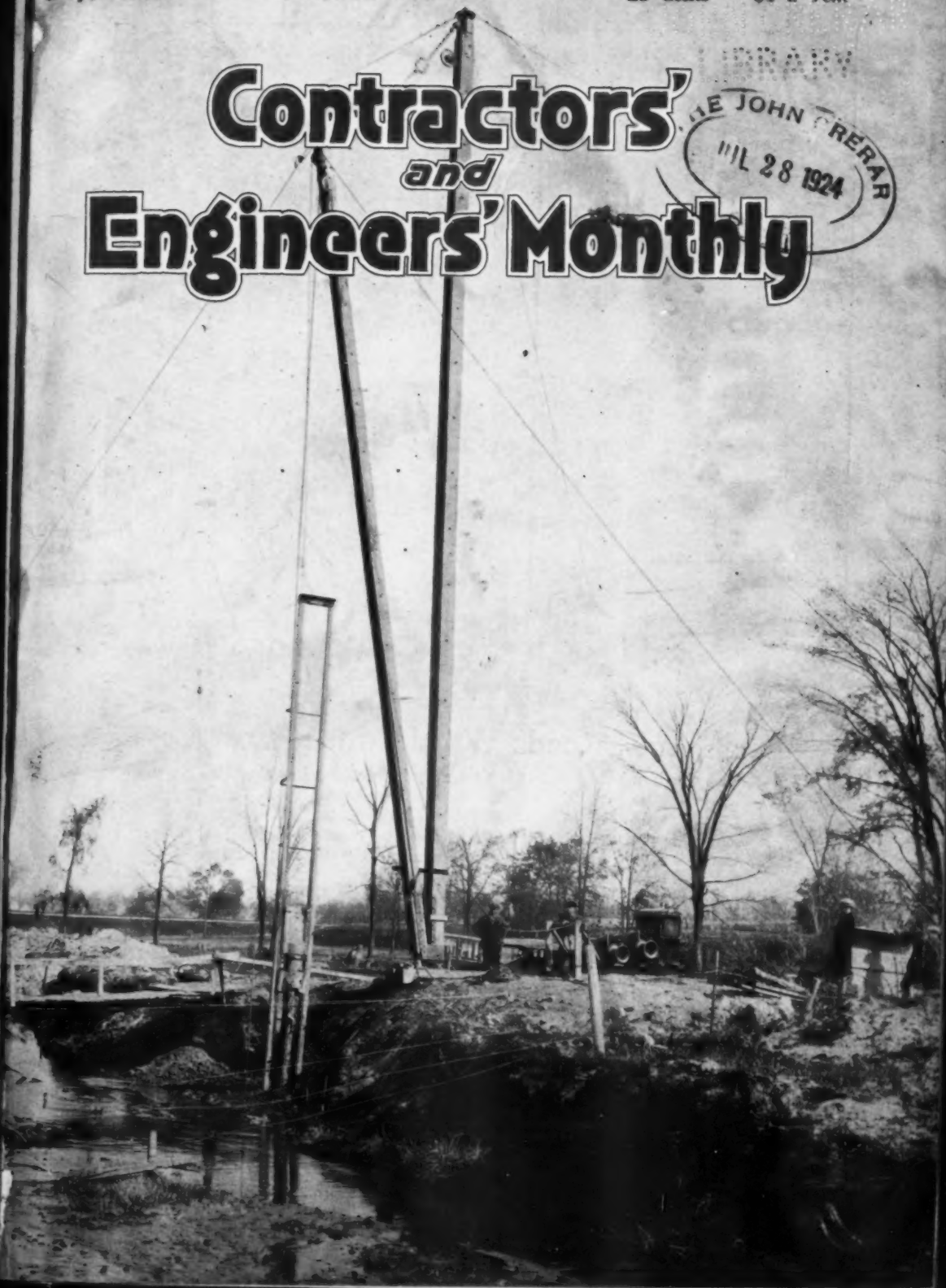
July, 1924

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Contractors' *and* Engineers' Monthly

THE JOHN C. RERAB
JUL 28 1924



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TRUSCON
WIRE MESH AND
CONTRACTION JOINTS

VOL. IX. NO. 1 CONTRACTORS' & ENGINEERS' MONTHLY

JULY, 1924

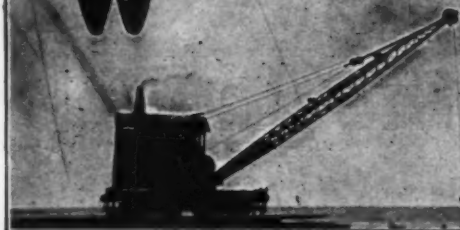
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Where to Purchase



A comprehensive classification of the leading machinery and supply manufacturers arranged for the convenience of contractors, engineers and public officials who may wish to secure information about construction equipment. A star (*) before the manufacturer's name indicates that his advertisement appears in this issue.

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The Koehring crowding action—absolutely independent of any other function—is accomplished by cables attached to opposite sides of reversing forward drum on the machine, leading down around fleeting sheaves at boom axis point and then to opposite sides of drum on skipper shaft. Automatic adjustment keeps cables taut at all times. Boom may be raised or lowered without tightening or loosening cables.

Heavy Duty! A Big Koehring Value

Not a phrase or a slogan, but an extra margin of strength—reliability in every detail. It means trouble-free operation—less depreciation, and longest service life.

The Koehring shovel is not merely a steam machine powered with a gasoline engine, it is strictly designed for internal combustion engines, which means greater efficiency and durability.

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No. 1— $\frac{3}{4}$ -cu. yd. dipper, water measure, or $\frac{1}{2}$ -cu. yd. dipper, heap measure, on 18 ft. 6 in. boom with 14 ft. dipper stick; 4-cylinder, 5x6 in. gasoline engine, 1000 R. P. M.

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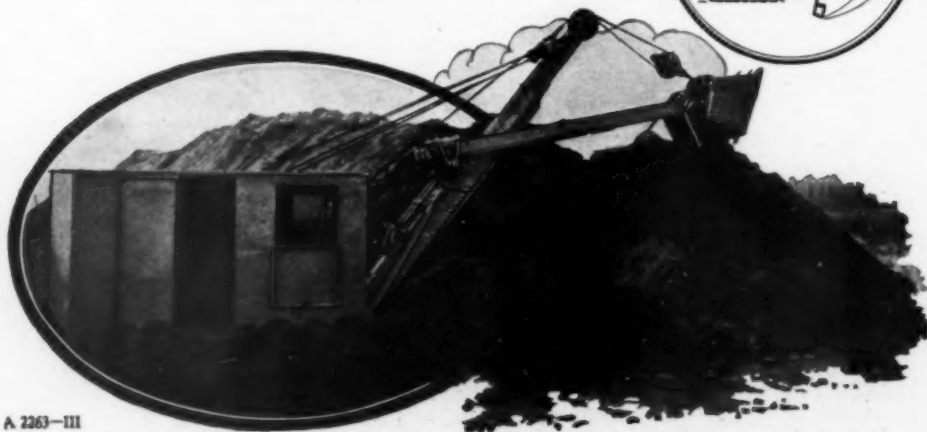
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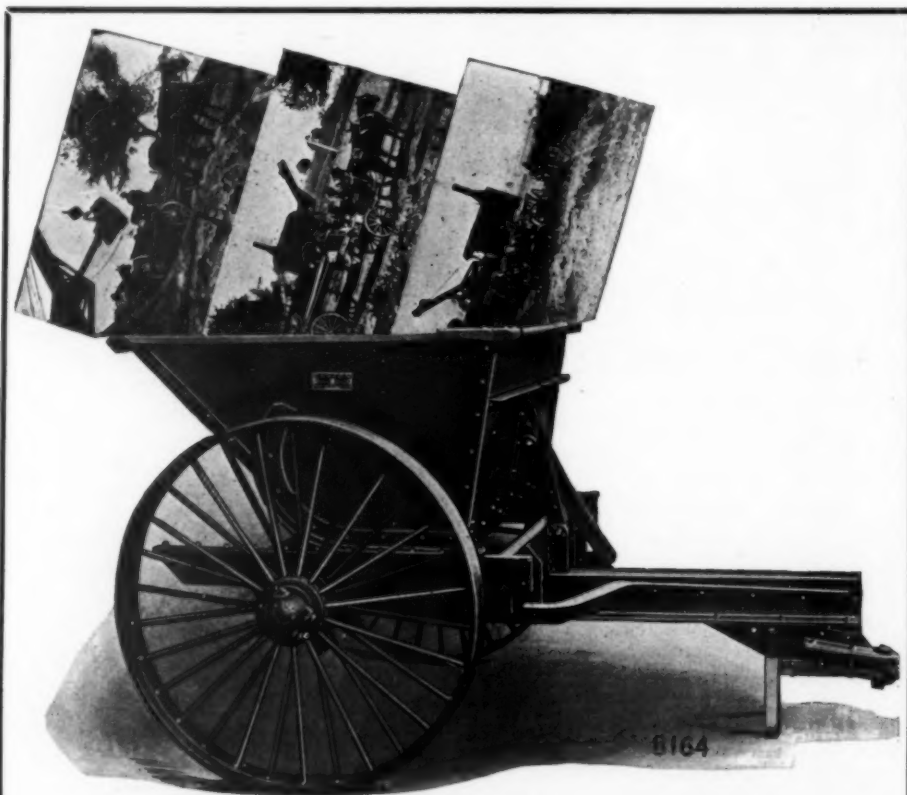
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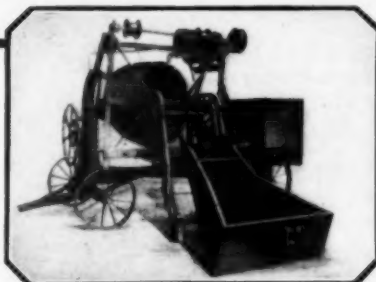
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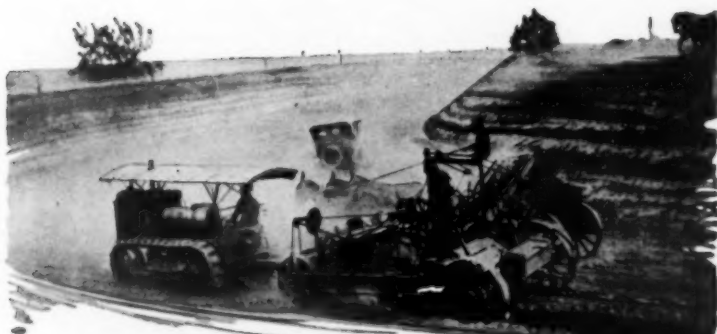
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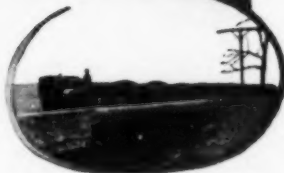
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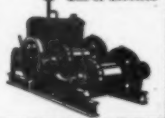
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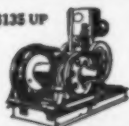
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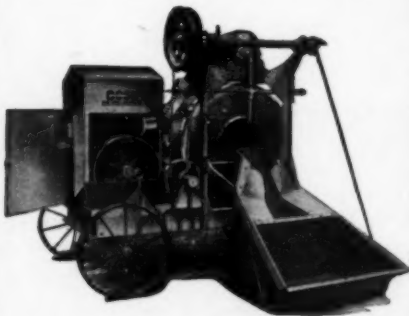
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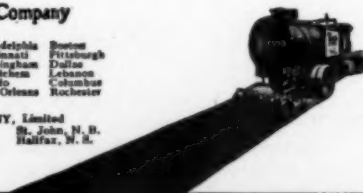
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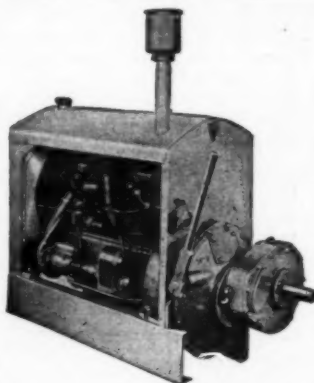
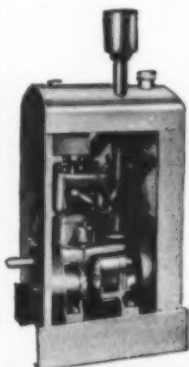
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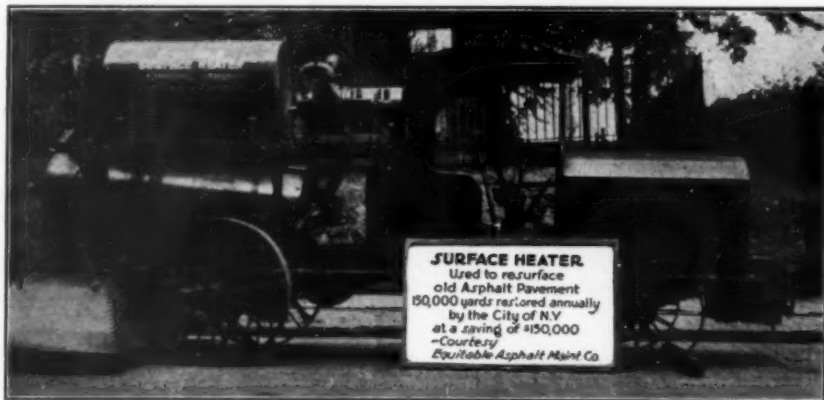
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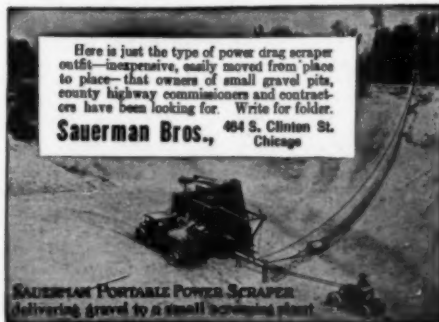
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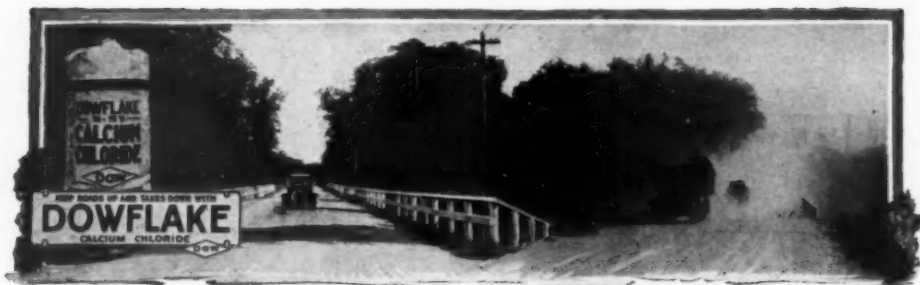
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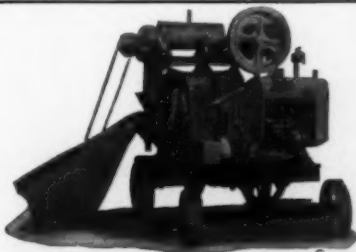
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Steel Pipe Siphon Replaces Stone Arch on Croton Aqueduct

Traffic Requires Removal of Arch Built in 1839 on Albany Post Road

By Fred S. Tebbutt

Assistant Engineer, Department of Water Supply, Gas and Electricity, New York City

TRAVELERS on the old Post Road from New York City to Albany, when passing through Washington Irving's Sleepy Hollow country at North Tarrytown, N. Y., have for the past 85 years gone through the fine old masonry arch bridge carrying the water of the Old Croton Aqueduct to New York City. They might have continued to do so for the next one hundred years, at least as far as the integrity of this structure was concerned, but the march of progress, bringing in its wake the modern traffic conditions, swarms of pleasure cars and motor trucks, encountered this old landmark as an obstruction and a menace, and as such compelled its removal by the city of New York through action of the Court.

The structure was typical of the masonry bridges of the Old Croton Aqueduct—fine pointed granite ashlar from native quarries, the arch ring composed of keystones and voussoirs of the same material. The arch



THE OLD CROTON AQUEDUCT ARCH, NORTH TARRYTOWN, MAY 23, 1923, BEFORE THE WORK OF DEMOLISHING BEGAN



THE OLD ARCH ON THE CROTON AQUEDUCT AND THE WOOD-STAVE PIPE WHICH CARRIED THE FLOW OF THE AQUEDUCT TEMPORARILY

was segmental, with a rise of 5 feet, the distance from the spring line to the roadway 6 feet 3 inches, giving a total height or clearance of 11 feet 3 inches at the center.

A modern motor truck or van passing beneath the arch had to keep directly in the middle of the road, and any other vehicle approaching would suddenly find its passage completely blocked, as the headroom on either side was cut down by the curvature of the arch. Hence the removal was fully justified on the record of accidents of the past few years.

It was decided to replace the arch and aqueduct with a steel pipe siphon passing under the Post Road, and to continue the use of the aqueduct during construction by means of a temporary wooden flume carried over the roadway on a wooden trestle, one of the contract requirements being that the interruption of the flow in the aqueduct should not be of greater duration than 48 hours.



FORCING UP THE LAST KEYSTONE BY MEANS OF A HAND-OPERATED JACK

To comply with the latter requirement, the construction of the flume and masonry was completed up to a point that when the aqueduct was shut down all that remained to be done was to break through the side walls of the aqueduct and build the masonry bulkheads to shut off the water from the portion of the conduit to be removed. This plan was carried out, with the exception that, because of distribution conditions, the city did not require that the 48 hours should be consecutive, so the work was done on the day shift only.

It is interesting to note that although the contract drawings required only an ordinary wooden box flume, the contractor at his own request substituted a wood-stave pipe manufactured on our western coast. Hence it appears that conditions in our lumber and skilled labor supply are such that it is cheaper to manufacture an 8-foot diameter pipe and trestle and transport them the entire width of the continent than to build an 8- x 8-foot box flume with local material and labor. Possibly the higher salvage value of the wood-stave pipe over the box flume is sufficient to be the determining factor.

After putting the flume in operation, the removal of the arch and superimposed conduit and embankment was commenced. The removal of the arch with a minimum of interruption to traffic on the busy thoroughfare beneath was somewhat of a problem, as the clearances were too small to permit of any scaffolding beneath the arch to protect the roadway. The conduit, embankment and spandrel walls above the arch ring were removed, leaving the single course of voussoirs stripped from spring line to spring line. By experiment it was then found that it was possible to force a keystone up and out of the arch ring by means of a 25-ton jack placed in the middle of the roadway with an 8- x 8-inch timber between the jack and the soffit of the keystone. The method then adopted was to remove one of the keystones from the arch ring and then remove the voussoirs on each side as far as they were relieved of bonding by the key-

stones' removal. After the third keystone was removed, the line of voussoirs released extended to the spring line of the arch. In this manner the whole arch ring was removed, the last keystone, after loosening, being pulled out by means of a chain attached to a motor truck. The interruptions to traffic were only for a few minutes at a time, the fallen masonry being of sizes readily handled and removed from the roadway.

Tribute is here due the men who built and supervised the building of this old structure, for in the masonry of the aqueduct and of the arch and abutments there was not found a brick nor a stone but what was solidly bedded with joints filled; not a

void or vacancy to be found.

The photographs show the process of forcing out a keystone, and the removal of the last keystone, causing the final demolition of the arch.

The new pipe siphon will pass beneath the roadway at the site of the removed arch, the bottom of the new structure being about 13 feet below the roadway. Instead of the usual timbered trench in which to lay the pipe across the roadway, with timber deck above to carry the traffic, the contractor has placed a reinforced concrete slab 30 inches thick the full 20-foot width of the paved roadway and 18 feet long, the surface of which corresponds to the adjoining pavement and is the permanent finished road surface. Under this slab a tunnel 20 feet long, 12 feet wide and 10 feet high will be excavated, in which to install the 8-foot 6-inch diameter steel pipe and the Venturi meter which is located at this point.

The advantages claimed for this method are that the large amount of storm-water which comes down the paved roadway of the long hill to the north will be carried over this slab, whereas a timber-decked trench would intercept it; also that the slab in one operation provides a bridge over the trench and forms the permanent restored pavement. In the construction of this slab no forms, of course, were required, it being cast upon the earth after excavating to the required depth.



THE REMOVAL OF THE LAST KEYSTONE BY MEANS OF A CHAIN ATTACHED TO A MOTOR TRUCK

The work has now progressed to the point where the excavation of trench for the steel pipe will begin, the removal of the arch, aqueduct and other excavation having been completed to the limits of the contract.

The new steel pipe siphon will be 8 feet 6 inches in diameter with 7/16-inch plate. At the lowest point of the siphon there will be incorporated a Venturi meter with a bronze-lined cast-iron throat-piece 50 inches in diameter. At the up-stream and down-stream connections of the siphon with

the old conduit, there will be chambers containing stop-plank grooves.

The Frederick Snare Corporation, of New York City, are the contractors for the work, with Stephen U. Hopkins, Engineer. The work is being done for the Department of Water Supply, Gas & Electricity of the City of New York, of which Hon. Nicholas J. Hayes is Commissioner, Col. Merritt H. Smith is Chief Engineer, Ralph N. Wheeler, Division Engineer, and Fred S. Tebbutt, Assistant Engineer in Charge of this work.

Status of Road Contracts in Kentucky

Important Decision of the Court of Appeals Regarding Available Revenue and Contracts Let

THE Court of Appeals of the state of Kentucky on May 6 declared that all contracts awarded by the State Highway Commission on December 10, 1923, were invalid. This action in the case of Billiter & Wiley vs. Highway Commissioners reversed the Franklin Circuit Court and was a distinct surprise to state officials and to practically all attorneys connected with the case, which has been pending for five months. The case was instituted by the Kentucky Association of Highway Contractors and is a distinct service to the public and to highway contractors in general. The suit to test the law originated wholly with the Executive Board of the Association and was filed at its direction with the consent of Billiter & Wiley. The services of the best legal minds available were engaged at no expense to the individual, resulting in an interpretation of the law, lacking which an incalculable loss might have been sustained by the industry, and many invalid contracts for public funds awarded. The authority and limitations of the Highway Commission in awarding contracts are determined, and a tremendous element of gamble is eliminated for all time. The entire credit for this work is rightfully claimed by the Kentucky Association of Highway Contractors.

History of the Case

When the Highway Commission awarded about \$3,000,000 of contracts on December 10, 1923, it was with full knowledge that its total current obligations for the fiscal year (July 1, 1923, to June 30, 1924) exceeded its estimated revenue for the same period. Doubt was expressed on all sides that those awards were legal, and consultation with several lawyers only cast further uncertainty over the situation. The executive board of the Kentucky Association of Highway Contractors, realizing that it was the only organization in the state representing the industry, directed a court action to have the contracts interpreted before the contractors incurred any liabilities under them.

Leon P. Lewis was engaged as attorney to test the law. In order to set up an issue, it was necessary to allege the contracts invalid, as the Highway Commission believed them to be good. It was naturally assumed that the Attorney General would defend the action of the Commission and the issue be fought out on its merits. In view of the Governor's attitude, however, it later appeared doubtful that the Attorney General would defend the Commission. Thereupon, the Ken-

tucky Association cooperated with the interested counties in the engagement of Charles I. Dawson, John D. Carroll, J. W. Cammack, and other eminent counsel to insure that the validity of the contracts would be adequately pleaded and the subsequent judgment be a clear and complete interpretation of law which would cover not only the present, but the future as well.

The Franklin Circuit Court, after hearing evidence and arguments, held the contracts good on the theory that revenues would be sufficient to pay obligations as contracts progressed in the usual course. The Court of Appeals has overthrown this decision and based its judgment on a unique theory, which was original with the Court and was not advanced by any of the attorneys in the case.

The following digest of the Court's opinion in this case by Leon P. Lewis is abstracted from *The Scraper*, the official organ of the Kentucky Association of Highway Contractors.

Digest of Opinion in Billiter & Wiley Case

The road contracts involved in the litigation were made on December 10, 1923, aggregating a total estimated cost of \$2,994,618.35. At that time there were outstanding road warrants and unpaid accounts on estimates of \$2,266,788.66; and uncompleted contracts in addition, to an estimated total of \$8,395,234.23. Of these sums, a considerable portion will be ultimately paid from Federal Aid and county gifts.

Giving the road fund credit for all of its estimated revenue for the fiscal year ending June 30, 1924, including the ad valorem, automobile license, and gasoline sales taxes, the funds in sight, according to the testimony of the State Highway Engineer, were sufficient to pay the state's portion of all the road completions up to that time. This was based on the estimate that not exceeding 60 per cent of the work on unfinished contracts let prior to December 10 would be completed, and not more than 30 per cent of the contracts involved in this litigation.

It was conceded by all parties that the total estimated cost of the contracts outstanding, including those let December 10, was greater than the total estimated cash and revenue for the fiscal year ending June 30, 1924.

The main question, therefore, squarely presented, was whether there was any legal limit upon the power of the State Highway Department to make road contracts, and if so, whether in computing the operations of a fiscal year the

estimated total of the contracts outstanding was the basis of computation, or the estimated total of completions during that period.

The Court held that each legislature has unlimited power to levy taxes, subject, however, to the right of the next legislature to change the system; and that if contracts should be made pledging road funds beyond the next biennial session of the legislature, this would limit the power of that legislature to exercise its own discretion in the levy of taxes and the appropriation of money. For that reason, the Court in effect takes two years as the unit, because the legislature meets once in two years and levies taxes and appropriates money for each of the two intervening years: therefore, the Court considers the status fixed for that period.

According to the Court's decision, a road contract is a debt of the state for its full estimated amount, and the cash on hand, coupled with the estimated revenue for the two-year period, must take care of the contracts outstanding during that period, and any valid deficit existing at the beginning of the time. The opinion is not explicit as to the division of contracts between the two years; but it seems reasonably clear that so long as the total contracts and valid claims outstanding are not greater than the estimated revenues for the two-years period, the contracts are valid, and any warrants issued in anticipation of revenue will be valid.

Several uncertainties as to computing revenue are cleared up, the previous decisions having left these matters in grave doubt. It is held that Federal Aid legally available may be included in the estimated revenues, as well as county or private gifts which are either actually in hand or legally enforceable. It is furthermore held that the use of automobiles is so large a part of our social and business life that the licenses on these machines, as well as the tax on gasoline to be sold during the period, may be estimated in ad-

vance and included in the revenues available.

The opinion recognizes the validity of the warrants and unpaid estimates outstanding at the time the contracts of December 10 were made.

As a session of the legislature convened in January, 1924, and the total of contracts, including those involved in this litigation, would be greater than the revenues for the fiscal year ending July 30, 1924, these contracts were held invalid in accordance with the reasoning of the Court as outlined above.

The effect of the decision is that the Highway Commission can make contracts on or after July 1, 1924, on the basis of the estimated revenues, for the two years ending July 1, 1926, as provided by the 1924 session of the legislature.

Effect of the Decision

While it is a matter for regret that these contracts cannot be carried out, still that aspect is entirely secondary to the important advantages gained. If the contract holders had proceeded with the work, a taxpayer could at any time have enjoined payment and the contractors would have lost all they had invested in the work. This could have aggregated well over \$2,000,000 and would have meant bankruptcy for many. Threats of such a situation were made before the Association's suit was filed, and in view of the Court's decision, the potentiality becomes a very grave reality, one which is fortunately removed by the Association's interest and foresight.

As to the practical effect: Pending the action of the Court of Appeals, there have been no contracts let except maintenance and, consequently, business has been dull. Certainly, four or five months have been lost, but from now on things should rapidly return to normal. The court decision authorized the Commission to advertise for bids this fiscal year on which contracts might be signed July 1. The estimated revenue for the coming fiscal year is \$9,000,000.

Miscellaneous Notes

Pile-Driving with a Gasoline Engine

WE are indebted to the Novo Engine Company, Lansing, Mich., for the interesting illustration appearing on the front cover of *CONTRACTORS' AND ENGINEERS' MONTHLY*. It shows a Novo AFDH hoisting outfit driving piles for bridge abutments near Williamston, Mich. The work was handled by the Wolverine Engineering Company, Mason, Mich. The outfit consists of a 4-cylinder engine and a double-drum hoist.

Twenty-four oak piles, 20 feet x 6 inches, were driven under each abutment. It took 17 minutes, when timed, to drive one pile. Another was driven in 45 blows. All of the piles were driven their full length. The hammer weighed 1,500 pounds. When timed, the hammer took 12 to 14 seconds per trip when the pile was nearly down. The brake was not used at all, the drum being stopped with the clutch. The piles were raised and placed by means of a line on a niggerhead when the engine was idling at less than 400 r.p.m.

The rear drum on the Novo hoist handled the boom line, and the front drum, the hammer. One-half-inch cable was employed, only one wrap on the drum being used on the hammer. The mast is 60 feet high and the boom 40 feet.

Kincaid Elected Vice-President of Garford

THE Garford Motor Truck Company, Lima, Ohio, has elected Russell M. Kincaid Vice-President of the company. Mr. Kincaid's connection with the company in the capacity of assistant to the President dates only from March 1.

Ditcher Company Moves to Dayton

THE Chas. T. Topping Machinery Company, formerly of Pittsburgh, Pa., has announced the removal of its headquarters to Dayton, Ohio. The post office address is Box 842, Dayton, Ohio. The offices of the company will be located at the plant of the Smith Gas Engineering Company, Moraine City, a suburb of Dayton, Ohio.

Gracely Becomes Assistant Sales Manager

THE Marion Steam Shovel Company, Marion, Ohio, has announced that Harvey T. Gracely, Advertising Manager, has been promoted to Assistant Sales Manager. His experience in engineering work and as an owner and operator of Marion equipment, and the last few years in sales and advertising work, have given him a background of contact and knowledge which fits him admirably for the work he is to undertake.

Legal Points for Contractors

These brief abstracts of court decisions in the contracting fields may aid you in avoiding legal difficulties. Local ordinances or state laws may alter the conditions in your community. If in doubt, consult your own lawyer

Edited by A. L. H. Street, Attorney-at-Law

An Unusual Method of Securing Payment of Compensation

A practical, although extremely unusual, form of contract was involved in the late case of *Burke & Farrar vs. Campbell*, 224 Pacific Reporter, 9, decided by the Washington Supreme Court. The owner of a building agreed as follows:

"Permission is hereby given Burke & Farrar to make repairs to the brick building in Kirkland, corner of Piccadilly and Market Streets, which repairs are to be paid for in rents received from tenants who may occupy the building. When all the expenditures have been paid to Burke & Farrar to reimburse them for repairs and money paid out and interest at 7 per cent, then arrangements may be made for future contract for the lease of the property."

Interpreting the contract, the Court said:

"Nor is that principle of law to the effect that where a contract provides that a certain thing is to be done, but fixes no time for the doing of it, the law will presume that the parties intended a reasonable time, applicable to the facts of this case. The substance—the meaning—of this contract is that the appellant shall have a right to receive the rents until the amount collected has discharged its claim. It is not like a case where one has agreed to remove timber from land and no time has been fixed for the removal. There the law will presume a reasonable time under all the circumstances. For the Court in this case to say that the appellant had only a reasonable time within which to pay itself out of the rent would be not only to read into the agreement something that it not there, but to contradict its necessarily implied terms. It is true that 12 years have elapsed since the making of the contract and that but a small amount has been collected, and it is also true that, because of the apparent inability to find tenants for the property, many more years may expire before appellant's claim shall have been paid, yet we cannot violate the spirit and terms of the contract because of these things. While the agreement is an unusual one, it is not uncertain in its terms, and we must enforce it as we find it. Manifestly, it was the intention of the parties that the appellant should be repaid out of the rents, and, if so, then it has a right thereto, until it has been fully paid, regardless of the lapse of time; provided, of course, it has performed its duty of trying to rent the property."

Delay in Performance of Building Contracts

By permitting work to proceed after time for completion of a building has passed, the most that the owner might lose by way of legal remedy would be the right to cancel the contract because

of delay without notice to the contractor and an opportunity to complete within a reasonable time thereafter, declared the Appellate Division of the New York Supreme Court in the case of *General Supply & Construction Company vs. Goelet*, 202 New York Supplement, 721. The owner does not, in such case, waive claim for damages on account of the delay. The Court added:

"Nor can the owner's counter-claim for delay be defeated, even if the plaintiff [the contractor] should have shown . . . that the delay in part was caused by the fault of the owner, since the contract specially provided that the contractor should be entitled to an extension of time for completing the building equivalent to any delay caused by the act of the owner, but that 'no such allowance shall be made unless a claim therefor is presented in writing to the architect and consulting architects within 24 hours of the occurrence of such delay.' No such claim was presented in the case at bar. There is no substantial distinction between a claim for extension of time in which to perform the work because of delays by the owner, and an excuse for failure to perform the work within the required time because of delays alleged to have been caused by the owner. In either case it is an allowance sought by the contractor. It is not a case where the contractor is seeking to recover damages upon the theory of a breach of the contract by the owner because of unreasonable or willful delay, but clearly is a contingency which the parties undertook to provide against in their contract, so as to avoid the uncertainty of disputes upon this question long after the occurrence of the alleged delays."

In the same opinion it is recognized that damages for delay in completing a building may properly be based on rental value of the building.

A Decision Under the New Jersey Mechanics' Lien Law

Failure of a contractor to substantially perform a building contract is no defense to a suit against the owner upon a stop notice, where the owner has had in his hands, after service, the amount claimed by the stop notice, and has paid the same to the contractor.

An owner, who has paid moneys to a contractor without production by the contractor of certificates required to entitle him to the payments provided for by the contract, cannot set up as a defense in a suit against him, instituted by one who furnished materials for the building and served a stop notice upon the owner, the non-production of the certificates. The owner by his action waived the production of the certificates. (*New Jersey Supreme Court, F. Bowden Company vs. Baier*, 123 Atlantic Reporter, 737.)

Recovery by Contractor on Substantial Performance

A contractor who has in good faith endeavored to perform all that is required of him by the terms of his contract for the construction of a building, and has in fact substantially performed the same, is ordinarily entitled to sue upon his contract and recover the contract price less proper deductions therefrom on account of omissions, deviations, and defects, chargeable to him, especially where the owner occupies and uses such building. Evidence tending to prove a substantial performance of the contract and a faithful endeavor on the part of the builder to perform all the terms of the contract is admissible. (Oklahoma Supreme Court, *Lane vs. F. S. Miller Lumber Company*, 222 Pacific Reporter, 968.)

Damages for Delayed or Faulty Execution of Building Contract

Said one of the Circuit Courts of Ohio in the case of *Smith vs. Hemington*, 31 Ohio Circuit Decisions, 344:

"Where the natural and direct result of the failure of the party to a building contract, who has undertaken to erect a building or buildings for another to perform his contract, is to cause the latter to suffer inconvenience in the use and occupancy thereof, or where such a result must have been contemplated by the parties to the contract as a probable consequence of its breach, we think that compensation for such inconvenience may be awarded.

"The law of damages for breach of contract is practically founded on the case of *Hadley vs. Baxendale*, 9 Ex. Rep. 341. It was held there:

"Where two parties have made a contract which one of them has broken, the damages which the other ought to receive in respect of such breach of contract should be such as may fairly and reasonably be considered either arising naturally, i. e., according to the usual course of things, from such breach of contract itself, or such as may reasonably be supposed to have been in the contemplation of both parties as the probable result of the breach of it."

Mechanics' Liens for Work Done for Tenants

Applying the provisions of the Ohio Mechanics' Lien Law, which are similar to those in force in several other states, the Ohio Supreme Court of Ohio decided in the case of *Mahoning Park Company vs. Warren Home Development Company*, 142 Northeastern Reporter, 883, that where, under the provisions of a lease for a term of years at a stipulated rental, certain repairs and improvements are to be made upon a building at the lessee's expense, which are to remain at the termination of the lease, the lessee is not thereby constituted the agent of the lessor, and the latter is not rendered liable by a contract entered into by the former in his own name for labor and materials to make such improvements; nor can the reversion in fee of the lessor be subjected to a lien for labor and materials furnished to the lessee pursuant to such contract. The court said:

"The application of our statute to the facts in this case (its terms need no construction) requires the conclusion that the plaintiff below could not obtain a lien upon the freehold, but only

upon the interest of the person with whom it entered into the contract, the owner of the leasehold. This is no hardship upon the contractor, for in every instance he knows, or at least it is incumbent upon him to ascertain, the ownership of the premises and the extent of the interest therein of the person who proposes to enter into a contract with him for the improvement thereof."

Contractor's Rights as to Undisclosed Construction Requirements

A highway contractor was not required to hand-place riprap, although plans approved by the State Highway Commissioner required it, where the County Engineer and the contractor honestly understood that such method of construction was not required. In reaching this conclusion in the case of *State vs. Clausen*, 223 Pacific Reporter, 591, the Washington Supreme Court said:

"At the time of bidding for this work the relator inquired of the County Engineer and was shown the blue-print from which there was omitted the words 'hand-placed,' the same with this exception being a duplicate copy of the map filed and approved by the State Highway Commissioner. The relator observed that it did not specify whether the riprap was to be hand-placed or loose, and upon inquiry the County Engineer informed him that it was loose riprap. It appears that neither the relator nor the County Engineer knew that the Highway Commissioner had included 'hand-placed riprap' in the plans approved by him as part of the improvement. . . .

"There can be no question but that it was the honest understanding of both the County Engineer and the relator that the plans did not require the riprap to be hand-placed. Nor was there anything on file in the County Engineer's office, the engineer in charge of the work, to indicate that hand-placed riprap was required. The question arises then, whether or not the expense of the error of the official of the state and county shall be placed upon the relator.

"Speaking of a mistake in plans, the Supreme Court of Illinois, in the case of *Sexton vs. City of Chicago*, 107 Ill. 323, stated:

"And if, through the city's negligence, a mistake occurred in making them out, the city must suffer the consequences."

"In a later case, *City of Elgin vs. Joslyn*, 136 Ill. 525, 26 N. E. 1090, the same Court stated:

"That a contractor who bids for work is bound only by the specifications which are shown to him at the time he bids, and upon which his bid is based and not by other specifications not then shown to him, and of which he was then ignorant, so that he did not and could not consider them in making the estimates for his bid."

Time for Filing Mechanics' Liens

Where a building has been accepted as completed according to the terms of the building contract, and the principal contractor paid in full for the construction of same, a subcontractor cannot extend the time for claiming, and filing a lien statement, by delaying for an unreasonable length of time performance of a trifling matter, although it may be required by the contract. (Oklahoma Supreme Court, *Holmes vs. S. H. Kress & Co.*, 223 Pacific Reporter, 615.)

Manufacturers ---- Distributors ---- Consumers

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Credit and Confidence

By H. W. Moore

H. W. Moore & Company, Denver, Colo.

WE listened to an address a few weeks ago by a man who had just returned from the heart of Africa. He said that down in that country money is an unknown quantity and trading is done in kind. Cotton cloth is exchanged for labor, mirrors for food, and jack-knives for land.

Most business here in this country is done on confidence. You persuade me that you have brains, ability, a good job and some money in the bank and I take that in exchange for what I have to sell — service, machinery, reputation for square dealing, or whatever it may be. Back of the exchange, however, is the question of legal tender.

A good many people are inclined to put the matter of monetary obligations in the background. Where money looms up, though, is when we turn to do business with somebody else.

I may be the finest chap in the world; a good counsellor and friend to the man who works for me or with whom I trade; but along with my good-will, he needs a little cash once in a while with which to pay for food, and occasionally some clothing, and, of course, it will be necessary for him to find a warm place to sleep in in the winter, although in the summer there are the public camp grounds.

However that may be, you and I have need to keep constantly in mind the fact that in the complex social order that now exists we are tied up together in such fashion that no man who asks credit can live unto himself.

Which brings us to the point where we see that credit is like the row of dominoes you used to stand on end when you were a boy and when you started one falling the whole row went down.

For instance:

Starting with iron ore deposits in the Mesaba Range of Minnesota and going on through miners, railroads, navigation companies, railroads again, steel mills, coal mines again, coke ovens and the different processes involved in producing and finishing in proper form the various chemical combinations that differentiate the several kinds of steel, we finally arrive at the manufacturing plant to

which is delivered the manufactured steel in proper shapes for fabricating into machinery.

No matter why, it is a fact that the machinery manufacturer must pay cash for the steel and iron he buys to make the equipment we sell.

In many cases his capital is limited and his problem is to fabricate his machinery, get it to the jobber at a far distant point, and get the money back in time to meet his demand drafts that the steel company insists upon, and so he agrees with the jobber that he will sell him a car-load of stuff on 30-day terms.

The jobber in turn sells it to a local dealer or direct to the user. His capital is meanwhile working overtime and his problem is to secure settlement for his stuff in time to take care of the next car that comes in from an eastern manufacturer.

A contractor undertakes a piece of work with the understanding that the owner will pay him on monthly pay-

ments—the owner or the county, or the city, or the state—and unless he is properly taken care of or has extensive capital, he disappoints the jobber, the jobber disappoints the manufacturer, and the manufacturer, since he cannot disappoint the steel company, doing business as he is on the old Chinese laundry basis of “No tickie, no shirtee,” goes right up in the air and wonders why he didn’t get in some less exciting line of business.

This, in a parable, is credit, and after years of business experience we have come to two conclusions: first, that it is better not to make promises that you are not sure you will be able to keep; and, second, it is better not to speculate with the other fellow’s money unless he wants it done.

I have come to have a sincere regard and friendly feeling for the chap who comes into our office, puts his cards face up on the table and says, “Your terms are 30 days. I want this piece of equipment but I cannot pay for it in 30 days, but I will pay for it in 60 days without fail.”

What the whole business world honors and respects and covets is the opportunity of doing business with people who make no promises that they are not sure they can keep: make no pretences, but deal in the gold coin of solid fact.

Pay When You Promise

It is better not to make promises that you are not sure you will be able to keep. It is better not to speculate with the other fellow's money unless he wants it done. H. W. Moore says he has a friendly regard for the contractor who frankly says he won't be able to pay in 30 days, but will pay without fail in 60 days. Frank and honest dealings pay every minute as well as in the long run.

Building Conditions in the United States

Prepared by S. W. Straus & Company

First Half of Year Shows Gains

CONTEMPLATED building projects throughout the country are slightly larger than at this time a year ago. In 322 cities and towns plans were filed and permits issued amounting to \$1,959,459,550 for the first six months of the year, a gain of 8 per cent over the same period last year. The same cities and towns showed a gain of 10 per cent for June, 1924, over June, 1923.

There is a steady slowing down in many places, but these losses are overbalanced by gains in New York and several other large cities.

Gains for six months in the leading cities were: New York, \$133,451,325; Detroit, \$22,193,000; Rochester, \$9,000,000; Boston, \$4,984,687; Newark, N. J., \$4,000,000; Cleveland, \$3,569,440; Milwaukee, \$3,000,000; Buffalo, \$3,000,000; Seattle, \$3,000,000; San Francisco, \$2,127,477; Baltimore, \$2,000,000; Portland, Ore., \$2,000,000; Dallas,

\$2,000,000; Louisville, \$1,500,000, and Denver, \$1,000,000.

Chicago, with a gain of \$16,600,000 over June a year ago, led all cities in this respect. Other cities showing gains in June over the same month last year were: New York, Detroit, Philadelphia, Cleveland, Milwaukee, Buffalo, Louisville, and Denver.

New York City made a gain of 54 per cent over the first half of last year. Plans filed for the first six months this year totaled \$561,161,014. Plans filed in June this year were \$70,391,004, a 23 per cent gain over June, 1923. Queens was the only borough which showed a loss from last June. All the boroughs showed substantial gains for the six months' period. Manhattan made a gain of \$75,000,000 for the half-year, and Brooklyn and Queens each gained \$25,000,000 for the same period.

TWENTY-FIVE CITIES SHOWING LARGEST VOLUME OF PERMITS FOR FIRST HALF 1924, ALSO JUNE PERMITS WITH COMPARISONS

	First Half 1924	First Half 1923	June, 1924	June, 1923	June, 1922
1. New York—P. F.	\$561,161,014	\$427,709,689	\$70,391,004	\$57,383,003	\$49,443,569
2. Chicago	159,964,370	188,391,962	34,288,250	17,683,550	26,576,850
3. Detroit	87,195,800	65,002,800	14,191,617	9,731,824	8,274,184
4. Los Angeles	78,828,738	93,889,205	10,292,542	15,075,466	10,652,265
5. Philadelphia	72,568,485	75,179,095	11,108,880	8,370,875	13,190,220
6. Cleveland	32,241,090	28,671,650	5,952,975	4,020,900	6,608,825
7. Boston—P. F.	27,669,543	22,684,836	3,795,161	4,042,264	4,432,566
8. San Francisco	26,537,669	24,030,192	3,899,374	4,213,346	3,336,701
9. Baltimore	25,150,650	23,642,585	1,339,500	2,713,140	2,658,480
10. Milwaukee	20,866,307	17,904,924	3,428,132	2,450,354	2,345,198
11. Washington, D. C.	19,748,926	30,195,546	4,077,880	3,954,670	5,799,947
12. Rochester	18,667,717	9,686,525	1,715,285	1,588,234	1,292,294
13. Newark	18,406,108	14,566,167	2,623,876	1,831,683	2,200,580
14. St. Louis	17,925,064	20,425,867	2,592,272	2,905,865	2,436,755
15. Pittsburgh	17,748,132	18,068,595	3,146,638	3,650,015	4,210,193
16. Seattle	16,892,950	13,739,443	2,094,350	5,230,445	2,290,855
17. Portland, Ore.	15,032,855	13,257,240	2,344,280	2,166,470	2,230,855
18. Dallas	14,718,258	12,089,377	1,882,666	1,648,155	1,533,046
19. Buffalo	14,455,000	11,238,000	2,936,000	2,097,000	2,265,000
20. Oakland	14,392,135	13,736,197	2,527,008	2,751,751	3,381,045
21. Cincinnati	13,577,685	15,301,415	2,030,195	2,452,355	2,187,225
22. Providence	13,157,500	16,305,900	2,685,200	2,592,200	1,879,900
23. Denver	12,911,150	11,534,450	2,389,850	2,071,700	1,815,700
24. Indianapolis	12,864,407	14,597,498	1,755,234	1,925,252	2,289,941
25. Louisville	12,450,707	10,953,994	1,236,791	863,594	1,577,950
	\$1,324,752,260	\$1,192,733,172	\$194,714,970	\$163,414,111	\$165,311,319

Note.—P. F. after cities indicates plans filed instead of permits issued.

SUMMARY OF FIRST HALF AND JUNE REPORT BY REGIONS

No. Cities	Regions	First Half 1924	First Half 1923	June, 1924	June, 1923	Gain or Loss First Half	Gain or Loss June
93	East	\$993,877,780	\$830,014,758	\$140,902,769	\$119,995,768	+20%	+17%
103	Central	561,449,369	580,900,817	99,893,747	80,936,640	-3%	+23%
76	West	248,045,159	259,935,867	34,277,136	47,937,310	-4%	-28%
50	South	156,087,251	150,913,072	22,084,913	21,024,093	+4%	+5%
322		\$1,959,459,550	\$1,821,764,514	\$297,248,565	\$269,893,811	+8%	+10%

Valuable Automotive Equipment for Contractors

Many Sturdy and Efficient Devices and Machines Make Use of Ford Chassis or Engines or the Fordson Tractor for Motive Power

THE remarkable development of standardized parts and quantity manufacture in the Ford motor truck and Fordson tractor, as well as the almost universal availability of service stations and spare parts, have led to the creation of a large number of machines and equipment using the Ford and Fordson equipment as their motive power. In the following pages are descriptions of some of the leading types of equipment available for contractors.

Axles and Transmissions

The Himico transmission, a well-designed three-speed forward unit with a single-plate clutch mounted on the fly-wheel, is manufactured by Hinkley Motors, Inc., Detroit, Mich., to increase the serviceability of Ford trucks. This unit is a four-speed sliding-gear transmission, made up of chrome nickel alloy steel gears with generous tooth face width, carefully heat-treated to withstand the stresses and wear. The main line drive is mounted entirely in annular ball bearings, and the counter-shaft drive is carried on phosphor



THE HINKLEY TRANSMISSION FOR FORD TRUCKS

bronze bushings running on case-hardened shafts. The sliding-gear shaft is carefully splined to the standard of limits which will insure ease of operation as well as a long-wear life. This transmission is so designed as to entirely replace the Fordson standard equipment in that it carries a ball socket complete with the Universal joint assembly and the propeller shaft brake similar in size and operation to the present Ford design. This transmission gives the following drives: direct, intermediate, low, reverse, and auxiliary low.

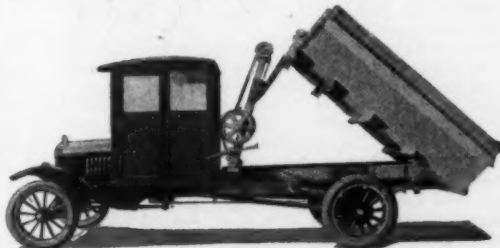
The Ruckstell axle for Ford 1-ton trucks made by the Ruckstell Sales and Manufacturing Company, Berkeley,

Calif., when installed in place of the usual Ford rear axle, gives four forward speeds in place of two. The gearing is so arranged that a lower low speed than the Ford low and intermediate between Ford high and low are provided. It is claimed that each of these gear changes gives 55 per cent more power than the current Ford gears. The intermediate gears enable the driver to make an instant change from high gear the moment the engine begins to labor on hills or in traffic. In addition to these gear changes, the Ruckstell axle provides an emergency reverse lower than the Ford reverse. This is invaluable at times when a heavily loaded truck is stalled under conditions where powerful reverse gearing is needed. This axle for 1-ton trucks is of planetary gearing installed in the left rear axle housing of the Ford truck, operated by a shift lever from the driver's seat. It is instantaneous in action, noiseless in operation and fool-proof. It does not alter any Ford working parts, and is installed as an integral part of the car. It can be used equally well with either the high- or low-speed worm-gear of the truck.

The Warford auxiliary transmission of the selective type for Ford trucks is made by the Warford Corporation, 44 Whitehall Street, New York City. This transmission combines under-drive and overdrive, in one unit. There are six speeds forward and three reverse speeds. The gears and shaft are 3½ per cent chrome nickel steel, making breakage practically impossible. The gears are quiet in operation and have an aluminum housing. The complete assembly adds only 35 pounds to the weight of the car. The Warford auxiliary transmission is said to make a reliable 2-ton truck capable of smooth-running at from 1 to 30 miles per hour under any condition of road or load.

An Extension Frame

Extension frames which make it possible to mount longer bodies than can be taken by the ordinary Ford chassis are made by the Swedish Crucible Steel Company, Detroit, Mich. Bodies measuring 54 inches wide, 96 inches long and 24 inches high, with a loading capacity of 80 cubic feet, mounted on No. 9 Olson extensions with sixteen-leaf side springs, 54 inches long, are used exten-

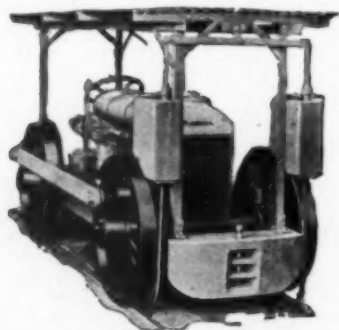


SWEDISH CRUCIBLE STEEL COMPANY EXTENSION FRAME

sively by contractors. Where the body is lengthened to such an extent that the actual wheel-base is increased, the Olson drive-extension shaft may be added to the regular Ford drive-shaft assembly. This extension is installed between the transmission and the regular Ford assembly and is supported by a cross member. The universal joint supplied for the drive-shaft is made up of standard Ford parts, making replacements very easy.

Industrial Locomotives

An outfit which makes it possible to make the shift from tractor to locomotive or vice versa in three hours without impairing the Fordson tractor in any way, has been placed on the market by the Adamson Motor Company, Birmingham, Ala. All parts are built standard, the different gages being accommodated in the changing of the wheels. When the gage is above 29 inches, the four wheels are 33 inches in diameter. When the gage is under 30 inches, the rear wheels are 36 inches in diameter and the front wheels 18



THE ADAMSON-FORDSON INDUSTRIAL LOCOMOTIVE

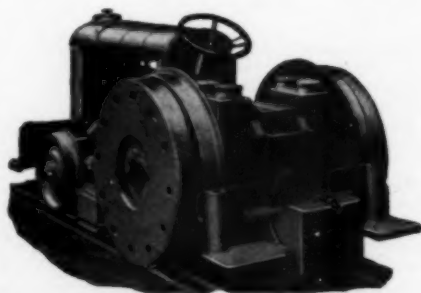
inches in diameter with a 4-inch tread. The wheel-base for the wider gages is 74 inches, and for the smaller gages 57 inches. This attachment on the tractor makes top of motor 4 feet above rails and makes it about 10 feet long to bumpers. It is rigged for carrying sand, the pockets for which are swung on posts that support the top, giving sand on all four wheels when running forward.

The Ford engine has been applied to gasoline locomotive haulage by the Brookville Truck and Tractor Company, Brookville, Pa. This outfit is particularly adapted to hauling in quarries, and on road construction or any other operation where a light industrial haulage system is desired. The power unit is a Ford 1-ton truck unit through-out to which is added the Brookville auxiliary reverse transmission, which gives the standard Ford truck high and low drive in reverse as well as forward. The locomotive is furnished with the standard low 3 miles and high 8 miles per hour both forward and reverse, but, if preferred, 3½ and 10 or 4 and 12 without any change over standard construction other than the sprocket on the Ford truck hubs can be furnished. The overall dimensions of the locomotive for gages under 42 inches are maximum width 48 inches, height above rails without the cab 48 inches, and with

the standard cab 5 feet 6 inches. For maximum-width gages above 42 inches, 4½ inches is added to the maximum width on each side. The outfit weighs 4,000 pounds complete, which varies slightly according to the gage.

Another type of industrial locomotive made by the Brookville Truck and Tractor Company, Brookville, Pa., uses the Fordson tractor as the motive power. This machine can be used wherever portable track is employed and for any type of locomotive haulage where a 3- or 4- ton gas locomotive could be employed. The first of these machines was made in 1917. This locomotive without change in the Fordson transmission or gears has two working speeds forward, low 3 miles and high 6 miles, with one approximately 6 miles reverse. Practically every haulage proposition is a comparatively easy trip one way, which can be handled satisfactorily with the single 6-mile reverse. On certain operations, because of favorable grades the light pull is with the loaded train, and on level track or where grades are against the load, the empty train. A feature of this locomotive is the use of small drive-wheels with a short wheel-base. Through the use of 20-inch diameter drivers, it is possible to have a short wheel-base of 36½ inches. This construction, combined with high-grade spring locomotive journals, gives locomotive equipment which is claimed to operate satisfactorily over the roughest track with extremely short-radius curves.

The industrial railway equipment for Fordson tractors made by Whitehead and Kales Company, Detroit, Mich., consists of two sets of flanged wheels, heavy cast bumper, and a brake-shoe which operates directly on the rails. This feature avoids the sliding of the wheels and the wearing of flat spots on the drivers. The brakes are operated by turning the steering wheel. No machine work whatever is required in installing the locomotive attachment or the brakes, making the installation very quick and simple. This locomotive attachment is supplied for 24-, 30-, 36-, one meter, 42- and 56½-inch gages. Sand-boxes are not fitted to the 24- and 30-inch gage. In the 36-inch and meter gage the standard Fordson rear axle housing and axle-shafts are used, but on other gages special housings and axle-shafts are necessary, which are furnished as a part of the locomotive attachment. The weight of the tractor and locomotive attachment complete with wheels, loaded and with extension, is 9,000 pounds, 7,600

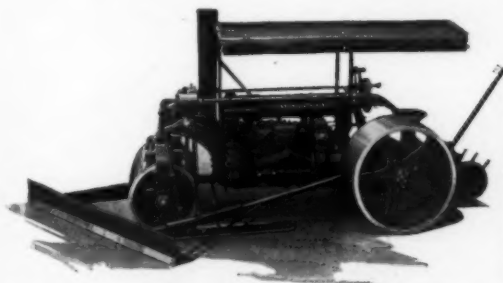


THE FORDSON TRACTOR IS THE POWER UNIT OF THIS WHITEHEAD & KALES INDUSTRIAL LOCOMOTIVE

pounds of which is on the drivers. The height from the top of the rail to the top of the machine is 57 inches, and the length over-all 120 inches. This industrial locomotive can haul 122 tons in low gear on the level, down to 4.1 tons on a 7 per cent grade. On intermediate gear, it can haul from 84 tons on the level to 3 tons on a 7 per cent grade, and in high gear 45 tons on the level down to 2.9 tons on a 3 per cent grade.

Road Rollers

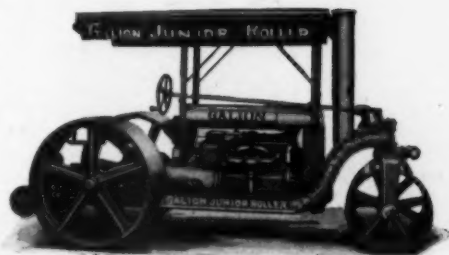
The Austin "Pup," a road roller made by the Austin Manufacturing Company, and sold by the Austin-Western Road Machinery Company, 400 North Michigan Boulevard, Chicago, Ill., is a 3- to 5-ton power roller using the Fordson tractor engine to furnish the motive power. It is particularly adapted for preparing the subgrade by bringing it to a true surface and saving all unnecessary out-



THE AUSTIN PUP—A LIGHT ROAD ROLLER AND UTILITY ROAD MACHINE

lay of concrete that would otherwise go to fill depressions in the road. It can be used as a regular small tractor, as it has ample power and will pull a wheeled or drag scraper or fresno or a small road machine or plow. The total length of the machine is 12 feet and the total width 5 feet. The machine will run at about $1\frac{1}{2}$ miles per hour in low and $2\frac{1}{4}$ miles per hour in high. The reverse speed is slightly over $2\frac{1}{2}$ miles per hour.

A Junior road roller of the three-wheel macadam type is made in 3-, 4- and 5-ton sizes by the Galion Iron Works & Manufacturing Company, Galion, Ohio, using a Fordson tractor from which the front truck and rear wheels have been removed. The power unit is carried on a full-length channel frame, which is shaped to receive the king post socket casting at the front end and extends to the rear of the unit so as to permit a scarifier to be properly attached. In the construction of the unit, the three-point suspension feature has been carried out, in order that the greatest possible flexibility may be secured without subjecting the power unit to any unusual strain. A full-length rear axle is provided which carries the weight through brackets attached to the main frame members in much the same manner as is employed in the construction of larger size macadam type rollers. A train of steel gears is provided which consists of a spur pinion placed on the main shaft of the Fordson unit, which connects with a spur gear on the bracket on the main frame, which in turn connects with the bull gear or main driving gear on the rear roll. This construction permits the use of all the speeds of



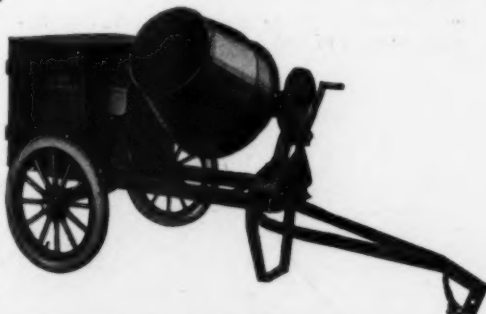
THE GALION JUNIOR ROAD ROLLER

the Fordson unit and increases the power $33\frac{1}{3}$ per cent. The roller may be operated with a planer or scarifier.

Concrete Mixers

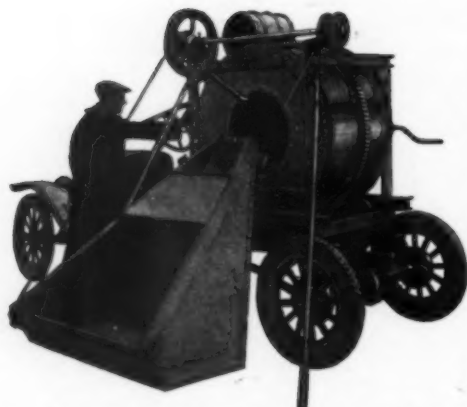
A low-charging tilting concrete mixer for use as a trailer behind a Ford truck or automobile is made by the American Cement Machine Company, Inc., Keokuk, Iowa. This Packard tilter mixer is capable of producing a batch a minute and is widely used for mixing cold patch, and also mixes mortar or plaster as well as concrete. It is mounted on artillery wheels, using 30 x 3-inch pneumatic tires, thus saving a great deal of the rattling and noise common to the hauling of mixers through city streets. It has a capacity of 5 cubic feet dry mix and is capable of pouring an average house foundation in one day. The machine weighs only 990 pounds complete.

The Archer "Auto-Mixer," made by the Archer Iron Works, Western Avenue and 34th Place, Chicago, Ill., is a concrete mixer moved and driven by the engine of a Ford 1-ton chassis. The Auto-Mixer is complete in itself, with loading platform, water-tank and chute, all of which are so fixed that they can be quickly assembled so that the unit can be moved quickly to the next job. The platform and hopper are so adjusted as to catch all of the material from a wheelbarrow without spilling. This one-bag mixer is rated at



THE PACKARD TILTING MIXER BUILT AS A FORD TRAILER

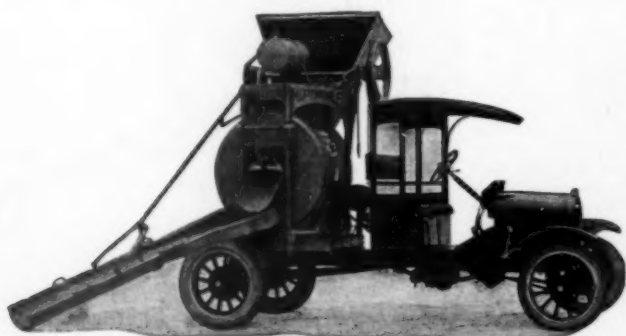
10 cubic feet of dry material or 7 cubic feet of wet concrete per batch, which is delivered thoroughly mixed in 30 seconds. The mixer is direct gear-driven with enclosed gear-boxes and gears



THE ARCHER MIXER MOUNTED ON A FORD TRUCK

running in oil. Hyatt roller bearings are used on the bottom supporting bearings. A larger unit, known as the "Speedmobile," is equipped with mixer, chute and loading skip. The skip goes to the ground over the front of the machine, and the discharge spout extends from the rear of the machine. When going to a job, the charging slip is carried above the machine and the paving chute alongside.

The Mixermobile is a 7-cubic-foot concrete mixer mounted on a Ford 1-ton slow-speed truck chassis. This equipment, made by the Milwaukee Concrete Mixer Company, Milwaukee, Wis., is driven by a pin-wheel drive and has an 8-foot distributing spout which can be swung through an arc of 180 degrees, thus depositing the concrete over a large area. The lever to the right of the truck driver diverts the power of the Ford from traction to the counter-shaft. Features of this equipment are its readiness for instant service, its swift movement from job to job, and the reserve power of the Ford motor which operates the mixer. The outfit is also made in a 5-cubic-foot size, the swinging distributing spout of which is 6 feet long. Both machines are equipped with power loaders of the pivoted type, having discharge angles of about 50 degrees.



THE MIXERMOBILE, A TRUCK-MOUNTED MIXER FOR CONTRACTORS

Plows

The Ferguson unit-type plow made by the Roderick Lean Manufacturing Company, Mansfield, Ohio, while intended primarily for agricultural work, has shown itself to be particularly adaptable to ripping up soil where it is desired to load with a drag scraper outfit. This plow is built exclusively for use with the Fordson tractor, is flexible in conforming to the ground and in turning, and plows at an even depth at all times. By using alloy steel in the construction of the Ferguson plow, a remarkably strong plow which weighs only about half as much as ordinary plows for the Fordson has been developed. The plow is easily and quickly attached to and detached from the tractor and has very few adjustments. The regular draw-bar cap of the tractor is replaced by one furnished with the plow, with which any implement can be used. After the draw-bar cap and the abutment above it are attached, the entire plow can be attached and detached in one unit like any other tractor plow.

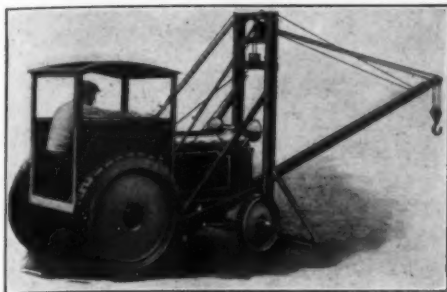


THE RODERICK LEAN PLOW FOR LOOSENING THE SOIL FOR DRAG SCRAPER WORK

Swing Crane

The Otis swing crane with a capacity of 1 ton on a 8-foot boom and a swing through 180 degrees has been developed by the Otis Engine Corporation, 247 Park Avenue, New York City. This crane is self-supporting on its own legs, which stiffly brace it when it is in operation, so as to relieve the Fordson tractor, on which it is mounted, of any excessive strain. When the hoisting operations

are completed, the whole crane with all its supports, including the mast and boom, is raised clear of the ground by the hoist in one operation and held there while going to the next job. By simply releasing the hoist lines, the crane automatically drops into position for the next operation. Booms up to 16 feet may be used for lighter loads. A digging or loading bucket may be attached to the boom to make this hoist and crane unit adaptable to contracting work for excavating cellars, loading sand, etc. A reversible hoist, single-drum, with a capacity of 1,500 pounds line pull on a single line and able to wind 600 feet of $\frac{3}{16}$ -inch cable, is

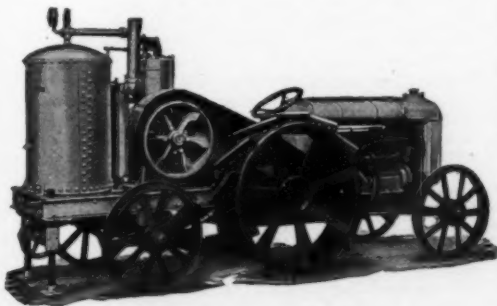


THE OTIS CRANE IS A MOBILE UNIT

mounted on the side of the Fordson. It is provided with a band friction brake and friction clutch and can operate at a rope speed of 50 to 250 feet per minute.

Tractor- and Truck-Mounted Air Compressors

The Curtis air compressor unit for Fordsons, made by the Curtis Pneumatic Machinery Company, St. Louis, Mo., is designed to give a portable compressor outfit for road contractors, and on well-drilling jobs and other places where a supply of compressed air is wanted, but where the installation cannot be made permanent and the plant must be capable of moving from job to job quickly. This outfit performs the work of the usual portable gasoline engine compressor outfit of the same capacity, but has the advantage that the tractor can be detached and used for any and all tractor purposes while the outfit is not being used as a compressed-air outfit. The compressor is large enough to take care of the average intermittent use of two special contractors' type jack hammer drills or any number of drills or other types of tools up to a total air consumption of 90 cubic feet per minute. The simplicity of attachment and detachment of the compressor unit to the Fordson tractor is such that a skilled mechanic is not required, nor does it require special tools or equipment to attach or detach the trailer. To detach the tractor it is only necessary to uncouple two trailer hook brackets which clamp over the rear axle of the tractor, take off the belt and disconnect a quick detachable attachment to the

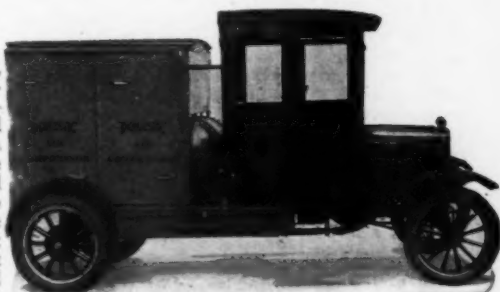


THE CURTIS FORDSON AIR COMPRESSOR

steering mechanism. The tractor is then ready for ordinary usage.

A compressor unit for mounting on a Ford 1-ton truck is made by the Domestic Engine & Pump Company, Shippensburg, Pa. This unit, No. 89, has a compressor displacement of 92 cubic feet, and the engine and compressor are built as an integral unit, thus combining compactness and strength with proper proportions and high mechanical efficiency. The ratio of the engine to the compressor is two to one, each compressor piston receiving the full power generated in two engine cylinders without transmission losses. This outfit has a two-cylinder engine and a one-cylinder compressor plant.

An air compressor, one end of which is supported by a castor wheel, and the other by a Fordson tractor, and which is belt-driven from the tractor, has been developed by Schramm, Inc., Westchester, Pa. When the outfit is moved about the endless leather belt which drives the compres-



A 92-CUBIC FOOT DOMESTIC AIR COMPRESSOR MOUNTED ON A FORD TRUCK CHASSIS

sor is quickly slipped off. When the tractor is needed for some other purpose than operating the compressor, it can be disconnected by simply removing four nuts and bolts. The Schramm compressor for direct-tractor drive, because of the thousands of Fordson tractors in use, is particularly attractive to contractors having need for both a small compressor and a light-weight tractor. It is particularly adaptable for rock-drilling, calking, pipe-testing, tamping and numerous other operations. The fact that the tractors can be used in almost all phases of contracting and construction work gives this type of compressor a strong appeal to those engaged in this class of work. The compressor, made in two styles, has a bore and stroke of 5 x 5 or 6 x 6 inches, with a range of speed from 355 to 510 r.p.m. and a piston displacement from 40 to 100 cubic feet per minute.

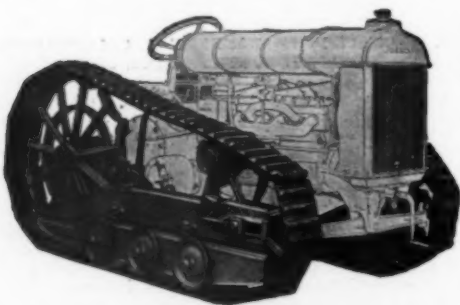
Schramm, Inc., also makes an engine-driven air compressor for mounting on a 1-ton Ford truck. This is particularly adaptable for contractors who have asphalt and concrete cutting and other street and trench work, demanding a compressor mounted on a motor truck, one which can be used on several small jobs in a single day, if necessary. The entire equipment is complete with air-tank, pressure-gage, safety-valve, drip-

cock, battery and tool-box, automatic pressure regulator on the compressor, gasoline vaporizer, and the latest type "hit and miss" style of governor on the engine. The engine and compressor, together with all of the equipment, are mounted on a steel channel frame to be attached to a standard Ford 1-ton truck. The entire equipment is housed in detachable canvas curtains which can be lowered to protect the outfit while not in use.

Traction Treads

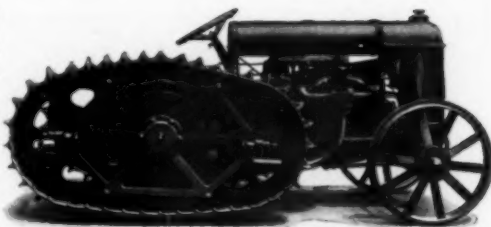
Full-Crawler treads, made by the Full-Crawler Company, 500 Clinton Street, Milwaukee, Wis., consist of a combination of steel frame, sprockets and tracks that when substituted for the four round wheels of the Fordson tractor, convert it into a crawler tractor. It has wide steel tracks of special ground-gripping design made so as to give the tractor plenty of traction in any kind of soil or surface conditions. The equipment is steered by means of brakes on the rear sprocket. These brakes are connected with the regular steering hand wheel so that a slight turn of the wheel to either side, as in ordinary steering, locks the brake on the inside of the turn, at the same time allowing the track on the outside to run freely. This equipment adds weight to the tractor, the weight being carried low and well forward, giving it a better balance. The surface pressure is only 334 pounds per square inch, which is less than that of a human being. The draw-bar pull is also greatly increased, and there is no slipping, thus eliminating all loss of power.

The Rigid-Rail track for Fordson tractors is made by the Hadfield-Penfield Steel Company, Bucyrus, Ohio. The track links are manganese steel castings shaped so that they will interlock when in contact with the ground, forming a



THE FULL-CRAWLER TREAD FOR FORDSON TRACTORS

smooth, rigid track which is the equivalent of a solid steel rail. It is claimed that this track has less than half the running parts of any other built and that there is no movement on the pins while under load, thus practically eliminating wear at the most vital point and avoiding the necessity of lubrication. The track links are designed and built on the cantilever principle. These tracks adapt the Fordson to road grading, ditching, pulling scrapers, and general contract work, adding 50 per cent or more to its power, and remove the wet-weather barrier which limits the use of wheel-driven tractors.



TRACTOR EQUIPPED WITH TRACKS TO INCREASE HAULING EFFICIENCY

The Johnson Trackpull tread for Fordson tractors is made by the A. C. Johnson Products Company, Racine, Wis. The track measures 50 inches on the ground, and the shoes 10 inches wide. The height of the track is 39 inches. The independent dry disc clutch and brakes in the sprocket are of special Johnson design. This equipment reduces the height of the Fordson 5 inches and reduces the width by 10 inches. The tractor is able to turn within its own length with no loss of power, and the rigid differential and clutch control adapt the Fordson to hillside work, road building, or any service where short turning is required. It is claimed that the Johnson Trackpull has a record of very low up-keep expense, which is backed by six years of field experience.

Saw-Rigs

The "Little Buddie," a one-man saw-rig which is attached to the front of, and is wholly supported by, the body of a Fordson tractor, is made by the Buddie Equipment Company, 10255 Harvard Avenue, S.E., Cleveland, Ohio. This equipment consists of a 30-inch cord-wood saw and belt mounted on a cold-rolled steel shafting 32 inches long by 1 7/16 inches in diameter. The use of this equipment saves much time in handling work where there is much wood to be cut up, as the outfit can be run from one place to another instead of moving all of the wood to the saw-rig itself.

Tractor Scraper Outfits

A rotary scraper for use with a Fordson tractor has been developed by the Killefer Manufacturing Company, Box 179, Huntington Park, Los Angeles, Calif. This rotary scraper is particularly adaptable to work where the material is to be dumped in a single pile or to be spread over an extended area. The dumping or spreading is controlled by a lever. When the bowl is fully loaded, it can be carried a long way with very little power by pushing down on the lever, as this tilts the bowl back so that it does not drag on the entire bottom. This lever control also makes it possible for the scraper to take a deep cut or a shallow one, according to the adjustment made on the lever. The dumping mechanism is controlled by a rope. A quick pull on the rope dumps the scraper, and another pull puts it into cutting position.

Another tractor scraper outfit which is easy to operate and which needs no stopping or backing to operate the scraper is the Miskin tractor scraper, made by the Miskin Scraper Works, Ucon, Idaho. This scraper is filled by lifting

a lever at the side of the tractor driver's seat and is dumped with a rope. The tractor carries the front end, and the scraper wheels carry the rest of the scraper, loaded or empty. This scraper is made in four sizes, from $\frac{1}{2}$ to $1\frac{1}{4}$ yards capacity. The No. 2 size, which has a width of pan of 5 feet and a capacity of $\frac{3}{4}$ -yard and weighs 600 pounds, is recommended for use with the Fordson tractor.

The Miami-Fordson one-man power scraper made by the Miami Trailer Company, Troy, Ohio, is operated by one man loading, transporting and dumping from the tractor driver seat without stopping, thus providing a continuous day-by-day operation, delivering 18 to 20 feet of rounded load of dirt in each trip. The tractor with this scraper operates about three times as fast as horses. In loading, the control lever is pulled backwards, lowering the pan ready for a load. If a stone or root is struck while loading, the wheels of the tractor spin around. The operator then raises the pan slightly, goes over the obstruction and immediately lowers it again on the other side to get a full load. In this way the unit cannot become stalled. To dump, the operator pushes forward on the control lever and winds the pan up to a perpendicular position, allowing all the dirt to roll out at the rear. This may be controlled so that all the dirt will dump in one spot, or may be distributed over the ground if the tractor is kept in motion.



MIAMI SCRAPER UNIT WITH FORDSON

makes it possible for the tractor driver to load the scraper by pulling lightly on the loading rope while driving straight ahead. The rope operates through a lever, acting the same as if an extra man walking behind raised the loading handle by hand. The harder the tractor driver pulls on the rope, the faster the scraper is loaded. To dump the load, the tractor driver pulls forward on the trip-handle, located on the hitch directly behind the tractor seat. This action releases the slide-bar of the hitch and allows the tractor power to dump the scraper. To spread the load, the trip-lever can be set to hold the scraper at various angles. After the scraper is emptied, the tractor and scraper return to the loading point, the tractor is backed 2 feet, which rights the scraper, and the operation is repeated.



MISKIN SCRAPER WITH ATTACHMENT FOR FORDSON

An automatic scraper hitch to attach any 5-foot Fresno, Sidney or Royal Buck scraper to a Fordson tractor has been developed by the Gustav Schaefer Wagon Company, 4180 Lorain Avenue, Cleveland, Ohio, for grading, excavating, leveling or filling. This combination makes an efficient earth-moving tool, making it possible to handle four times the usual amount of earth, because with this attachment the tractor can be kept moving steadily and rapidly, a larger load picked up each time, and the loading, spreading and dumping operations performed much more quickly than by hand. The Schaefer automatic scraper hitch

Truck and Wagon Loaders

A highway model truck loader with a Fordson power-plant, mounted on creeper traction, has been developed by the George Haiss Manufacturing Company, Inc., 142nd Street and Park Avenue, New York City. The loaders which it had previously developed could be used only for light work, as the Fordson tractor was used not only to furnish power, but as the support for the loading element, and the tractor was designed to pull a load and not to carry it. On the new Haiss unit, the tractor is stripped of its wheels and mounted in the loader chassis, providing the power-plant and transmission for the loader. The loader frame is mounted on Haiss creeper elements by a 3-point suspension, the treads being 10 inches wide and 5 feet long between centers, or 7 feet over all. A positive crowding speed of $2\frac{1}{2}$ feet per minute is provided, and the patented feeding propellers clean up a path for the loader. The elevator buckets, which are 12 x 16 inches, with teeth, are mounted on two strands of combination chain. The capacity of the loader is 1 to $1\frac{1}{2}$ cubic yards per minute. The controls are all located at the operator's platform on the left side of the loader. The traveling speeds are 40, 70, and 180 feet per minute forward, and 70 and

2½ feet per minute in reverse.

The Lessmann dirt and gravel loader and auto dump scraper made by the Lessmann Loader Manufacturing Company, Box 1593, Des Moines, Iowa, are pieces of equipment for mounting at the front of Fordson tractors. The dirt and gravel loader is made of heavy sheet steel with a 42-inch base and positive-action lifting ¼-cubic yard of dirt to a maximum loading height of 6 feet 6 inches. The loading, hoisting and dumping are under the complete control of the tractor driver. This loader lifts the load to the desired height, carries it to the wagon and dumps it, performing the work of a man with a shovel but handling from 800 to 1,000 pounds at a time. The regular draw-bar work of the Fordson is not impaired by the Lessmann loader equipment, but even with this equipment attached, the tractor may be used for snaking trailers around and then for loading them. The auto dump scraper may be used for filling a cement mixer, scraping, grading and shifting dirt, and other similar work. The bucket lifts a ¼-



THE NEW HAISS WAGON LOADER WITH FORDSON POWER-PLANT

cubic yard to a maximum height of 36 inches, and works as well on side grades as it does on the level. It is particularly adapted for moving dirt short distances where it is not advisable to load into a wagon.

Another loader attachment for the Fordson tractor is made by the Spears-Wells Machinery Company, Oakland, Calif. This loading attachment is a complete and independent unit, designed especially for handling sand, rock or gravel from stock piles, or loose dirt in street or road grading. The main features of this equipment are that the operator faces his work at all times, and that the elevator drive is entirely independent of the propelling mechanism. The loader has three digging and loading speeds. The loading unit consists of an 18-foot all-steel chain and bucket elevator with a capacity of from ¾ to 1 cubic yard per minute, and a ribbon screw feeding device attached to the elevator tail-shaft, which digs a path for the tractor and loads the bucket. The loader unit can be quickly detached from the tractor, leaving the latter available for other work.



LESSMAN LOADER ON FORDSON TRACTOR

A wagon-loading machine with an all-steel chassis frame, mounted on a standard Fordson tractor, is made by the N. P. Nelson Iron Works, Inc., 212 40th Street, Brooklyn, N. Y. This machine has a rigid truss steel frame with steel panels to protect the operator from falling materials. A long swivel spout swinging through 180 degrees discharges either sideways or endwise. The elevator is driven directly from the Fordson engine and runs continuously, the Fordson clutch and gears being left free to crowd, feeding the elevator rapidly or slowly as may be desired. The machine is run by one man, who stands on the platform at the side of the loader, where he can clearly see every part of the digging and loading operation. The loader has three speeds in reserve and one speed forward. Its capacity is claimed to be 40 to 60 cubic yards per hour when handling loose material. The weight of the loader is 4,700 pounds, and complete with the Fordson, 7,025 pounds. Its height is 15 feet, 8 inches; length 18 feet, 9 inches; and the width at the wheels, 5 feet, 10 inches.

The Specialty Fordson loader made by the Specialty Engineering Company, Allegheny and Trenton Avenues, Philadel-



THE SPEARS-WELLS FORDSON-DRIVEN WAGON LOADER

phia, Pa., is mounted on a Fordson tractor, using the tractor as its power-plant. The loader consists of a chain and bucket elevator, the conveyor boom and the supporting frame. The frame is built of structural steel, is mounted on the rear axle, and carries inclined chain-and-bucket elevators at the proper angle for efficient work. The buckets are carried by two high-grade endless chains. On the end of the chain are rollers which travel on steel tracks. The conveyor mechanism is of the endless conveyor belt type and serves to move the material forward beyond the front of the tractor. The frame includes four steel up-rights, two of which are attached to the rear axle, and the other two clamped to the sides of the radiator. The loader may be purchased separately and installed in a few hours' time by any Ford service station. The equipment is driven from the power-take-off shaft of the Fordson, a sprocket wheel being furnished to replace the customary drive pulley. A clutch is also provided on the counter-shaft so that the loading equipment may be stopped or started in conjunction with the tractor clutch. A pair of jack-screws are provided at the lower end of the elevator to give road clearance when the equipment is moved from one job to another. It has a capacity of 1 ton per minute for handling maximum lumps $2\frac{1}{2}$ inches in diameter. The height over-all is 11 feet 3 inches, and the discharge height under the end of the belt conveyor is 8 feet 6 inches.

Special Bodies

A contractor's body with vestibule cab particularly adapted to general light haulage for mounting on a Ford chassis is made by the Standard Commercial Body Corporation, New York, N. Y. This body is heavily timbered and is well supported beneath to insure long life and service under the heavy strains and vibrations it is subjected to in contracting work. It is equipped with a regulation wind-shield and dash, spring steel cushion seat and spring steel lazy-back. It has combination running-boards and fenders and drop sash windows at the driver's seat. Hand-forged U-brackets are furnished for carrying pipes, ladders or other equipment. The end-gate is heavily ironed and has short chains. The inside dimensions of the model 85-C body are 96 inches long and 44 inches wide. This company also makes a number of other open and closed model express bodies which are adaptable to special haulage requirements of contractors.

Trailer Equipment

Several types of trailer units for use with Fordson tractors are made by the Miami Trailer Company, Troy, Ohio. The Miami-Fordson all-steel dump trailer body is made of steel with a rear bottom-dump door, the size of the opening of which may be controlled either to dump the entire load at once or to spread the contents 60 inches wide to meet any depth desired. These units are particularly fitted for road and street contract work. The turning radius is that of a Fordson, and the unit can be backed into any position or can easily be turned around on the subbase of a road. The carrying capacity is $2\frac{1}{2}$ tons and the



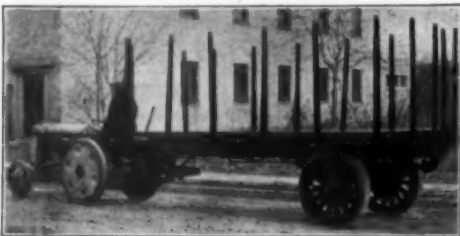
A STANDARD CONTRACTOR'S BODY WITH VESTIBULE CAB

loading height 16 inches. The trailer is equipped with Timken tapered roller bearings, solid rubber tires, semi-elliptic springs and a special hitch for use with the Fordson. A Miami-Fordson rear-dump hand hoist trailer has been developed which the loading height of which is 48 inches. The hand hoist is designed to dump the steel rear-dump body readily when loaded to its full capacity of 2 yards. The Miami lumber trailer, which has a capacity of 5 tons, can handle a load up to 25 feet long. It is equipped with solid rubber tires, artillery wheels and a special cast-steel ball hitch between the first and second units. The stake platform trailer has a carrying capacity of $2\frac{1}{2}$ tons and is equipped with 34-inch artillery wheels with solid rubber tires, or 34-inch steel wheels with 8-inch steel tires. The loading height is 46 inches, and the stakes, which are 30 inches high, are removable at the sides and ends.

Flat-body semi-trailers for use with Fordson tractors have been developed by the Trailmobile Company, 31st and Robertson Avenues, Cincinnati, Ohio. These outfits are two-wheel trailers, specially designed so that the tractor carries a proportion of the load, which is highly desirable for various reasons: first, its weight gives ample traction to the driving wheel, so that it is not necessary to have heavily weighted wheels; second, the entire outfit is compact; third, it can easily be manipulated, turned and backed by one man. The Trailmobile carries most of the load, but about 30 per cent of it rests on the hubs of the Fordson. There is no load near the center of the worm-gear housing of the tractor, because a specially designed steel bridge, which is part of the Trailmobile equipment, spans the tractor housing from hub to hub and distributes the load. All 5-ton models have a spring at the front to relieve the Fordson and the Trailmobile from road shocks of heavy loads. This trailer has a wide built-in floor which, together with the stakes, provides a complete platform body. The regular equipment comprises the Trailmobile, steel bridge for the rear axle housing of the Fordson, draw-bar and hand brake for service and emergency, operated from the driver's seat. These are also made in 6-ton-capacity low-slung trailers and with 5-ton roll-off dump bodies, as well as 2-yard end-dump bodies with hand-operated dual cable dump equipment. One of the particular features of the Trailmobile is that it can be left at the designated spot to be loaded while the tractor is moving a loaded trailer, thus eliminating waste time, waiting for the loading of individual trucking units.

The Trail-Ford Corporation, Ann Arbor, Mich., has developed a trailer truck for use with the Fordson tractor. This truck is mounted on two wheels and is flexibly attached to the rear of the Fordson tractor, and includes a steel cab mounted on the tractor. In order to take care of the additional weight imposed on the Fordson, special Trail-Ford spring axles are used on the tractor. The chassis weighs 5,000 pounds, has 7-inch side frame members and Bethlehem steel wheels. The tires are 36 x 10 inches and the body measures 6½ feet wide x 14 feet long, having a capacity of 5 to 7½ tons. The service brakes are operated from the driver's seat, and the whole outfit has a speed of 12 miles per hour. The cab is equipped with a lazy-back seat, full-vision wind-shield and snap-on curtains. The Trail-Ford rear wheels for the Fordson have a 56-inch tread and weigh 175 pounds each without tires.

A trailer of either the bottom- or the end-dumping type has been developed by the Troy Trailer and Wagon Company, Troy, Ohio, for use with a Fordson tractor. The Model No. 10 unit has an end-dump steel body, 54 inches wide, 96 inches



THE TRAILMOBILE UNIT USED WITH A FORDSON

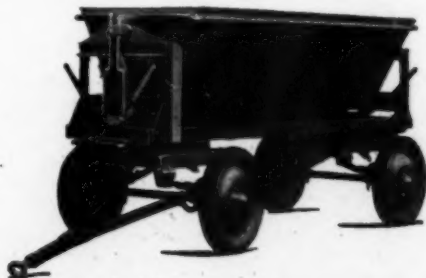
long and 18 inches high. It is dumped by a horizontal hand-operated hoist, giving a dumping angle of 45 degrees. The two wheels of the unit are of the artillery type, made of wood. An automatic tractor hitch is provided, which takes a portion of the load from the 1½-cubic-yard body, carrying it to the tractor. The Ajax-Semi trailer is a bottom-dumping wagon, also for use with the Fordson. The body is built of 1¾-inch tongued and grooved wood, with the top edges and corners thoroughly ironed. The inside dimension of the 1-yard body is 37½ inches, and the body is 53¼ inches long and 22 inches deep. The height from the ground to the top of the body is 4 feet. The doors are of No. 10 gage sheet steel overlapping 2 inches in the center and turned up at the edges. The ground clearance with the doors closed is 23 inches, and with the doors open with the sliding hinge, 18 inches. The winding device for holding up the doors is simple, one lever winding and the other dumping and locking. The two wheels are equipped with steel tires and they track 56 inches. This bottom-dump wagon is made in 1, 1½ and 2 yards capacity.

All-steel 3-cubic-yard side-dump bodies mounted on rugged trailer units with a wheel-base of 96 inches, solid tires, solid wheels with Timken roller bearings and a turning radius of 16 feet are made by Whitehead and Kales Company, Detroit, Mich. These side-dump bodies operate from four positions at either corner of the trailer by hand. The body locks automatically on return to the upright position.

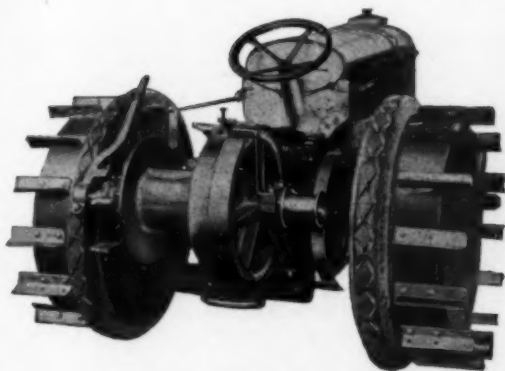
Hoists

The Clyde tractor hoist, which is easily attached with a monkey wrench to a Fordson tractor, is made by the Clyde Iron Works, Duluth, Minn. This single-drum hoist has a capacity on a single half-inch cable of 4,000 pounds at 175 feet per minute and an ultimate pulling power of 8,000 pounds. It consists of a friction drum supported tractor by eight bolts which connect the rear axle housing and the transmission housing, and two bolts through the two outside holes in the draw-bar cap, so arranged that the draw-bar can be used for hauling without removing any part of the hoist. Power is supplied through a roller chain drive and sprocket from the pulley-shaft of the Fordson. The diameter of the drum barrel is 8 inches, and its rope capacity is 600 feet of ½-inch cable.

The "Hyster" hoist is a compact, general-purpose unit, manufactured by the Ersted Machinery Manufacturing Company, Portland, Ore., for mounting on the front end of a Fordson tractor. This hoist is now made in but one model, "U," but by the simple attachment of auxiliary equipment, including a haulback drum, all former models can be assembled, with this as a basic unit. This hoist is self-contained in a semi-steel main frame cast in one piece, the frame being machined for the attachment of all standard auxiliary equipment. The hoisting drum is cast in one piece with the brake frame and ratchet ring on opposite flanges. There is a cone friction clutch on the main hoisting drum especially adaptable for pile driving and all fast hoisting operations. For such work as drag-line scraper or stump pulling, where it is not advisable to use the friction clutch, the drum and the main gear may be locked together to rotate as a unit. A gypsy spool of proper size and design for hoisting timbers, reinforcing steel, etc., is standard equipment. The hoist is attached to the Fordson through channels that are bolted rigidly to the ends of the special radiator bottom tank, which replaces the Fordson tank, and to machined brackets bolted to the flange of the tractor transmission housing. The hoist is operated and controlled from the driver's seat and is designed for a maximum hoisting capacity or line pull of 5,000 pounds and for hoisting or line speeds of from 50 to 300 feet per minute. The cable capacity is over 500 feet of ½-inch line. Equipped with a material elevator spool and reverse gears for operating double cage material elevators, this unit makes a complete building contractors' hoisting

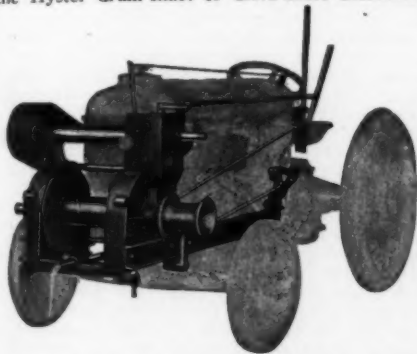


A WHITEHEAD & KALES TRAILER DUMP-TRUCK UNIT FOR TRACTOR HAULING



CLYDE HOIST MOUNTED ON FORDSON

equipment, tractor and power-supply unit combined. Three separate hoisting operations can be carried on intermittently from the main drum, the gypsy spool or the elevator spool, without removing the cables. In addition, the Fordson may be used to supply power while hoisting, for operating a concrete mixer or other machine driven from the Hyster drum-shaft or drive-shaft extensions.

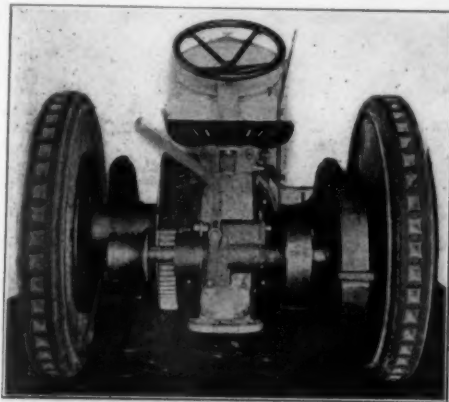


THE "HYSTER" HOIST ATTACHED TO A FORDSON

The White hoist, made by the Oklahoma Engineering and Foundry Co., Muskogee, Okla., can be built into the rear end of a Fordson in about four hours. It provides a powerful portable hoist for all kinds of contracting work. In operating the hoist the driver sits in the seat and faces his work at all times. All moving parts except the drum are enclosed, insuring safety to the operator. The load capacity and lifting speed which is commonly used with standard gearing is 2 tons at 100 feet per minute. The capacity and speed may be varied, by the use of different-size sprockets suited to the particular type of work to which the hoist is adapted. The hoist derives its power from the standard pulley attachment, from which a sprocket and chain transmits the power to a counter-shaft, which in turn drives the drum with sliding gears. Hyatt roller bearings are used and lubricated by the Alemite system. Either a pulley or a niggerhead which can be attached or

detached in three minutes may be used in conjunction with a cable drum to handle extra line.

A three-speed single-drum reversible hoist, using the Fordson engine, has been developed by the Otis Engine Corporation, 247 Park Avenue, New York City. This hoist has a load capacity of 3,500 pounds on a single line at 150 feet per minute and one speed faster up to 500 feet per minute and one speed slower down to 20 feet per minute. The change in speed and reverse is made instantly from the operator's position. The standard drum is 14 inches in diameter by 15 inches long between 26-inch diameter flanges. The drum will wind 1,900 feet of $\frac{3}{8}$ -inch cable. This outfit is also made in a two-drum type and as a balanced elevator hoist. With a slightly different equipment this outfit may be used as a concrete tower hoist, having a load capacity of 5,000 pounds, with a 1-cubic-yard bucket, at 120 feet per minute average speed for full drum.



THE WHITE HOIST MOUNTED ON A FORDSON

Worm-driven hoists which may be attached to the front of a Fordson tractor are made by the Sheffield Tool & Supply Company, Sheffield, Pa. All of the gears and bearings for this equipment are standard Fordson parts, except the bearings on the drum-shaft, which are Gurney. This insures quick replacement in case of the breaking of any parts. The drum is mounted on double bearings, to take care of high speed and crushing load. Everything is enclosed and runs in oil. Safety to the load is insured by the worm drive, which will not spin backward if the power is shut off. When a momentary stop is desired, the Fordson clutch is depressed without applying the brake, making it possible to hold approximately 3,000 pounds on a single line. The three speeds forward and one reverse machine give a wide range of both cable speed and power. This equipment does not interfere with the draw-bar of the Fordson, and the efficiency of the tractor is not impaired. The additional weight of the drum in front is an advantage in pulling heavy loads up sharp pitches. If the tractor should get into a



THE OTIS HOIST USES THE FORDSON ENGINE FOR POWER

bad hole or swamp where traction fails, by unwinding the tubing line from the drum and anchoring it, it is possible to pull the tractor out with the hoist.

Motor Pumper

A small pumper which is attached to the front end of a Ford machine or Fordson tractor has been developed by the Barton Products Company, Jackson, Mich. This pumper, the initial installation of which requires only about 1½ hours' work, will lift water by suction 26 feet and has a normal discharge capacity of 250 gallons per minute, with an engine speed equal to 20 miles per hour on the road. It is adaptable for use in unwatering flooded trenches, providing an auxiliary water-supply for road work, and inasmuch as the pump is equipped with an open runner, it is possible to pump water containing small sticks and gravel such as the contractor is liable to encounter on the job. The connection used between the pumper and the cars is of simple construction, and strong enough to carry the pump at the front end of a Ford, and it can be left on while driving, with no danger of strain or breakage to the car, as the weight of the pumper is carried entirely on the front, relieving the crank-shaft and motor at all times.

Graders

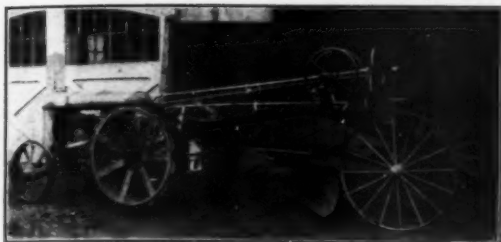
A one-man grader for use with the Fordson tractor, having the leaning wheel feature of all Adams' graders, is now being made by J. D. Adams & Company, Indianapolis, Ind. With this piece of equipment the operator may either stand or sit on the grader and have an unobstructed view of his work, handling the entire outfit easily. The steering is done with one hand easily, so that

the operator can make blade adjustments while the outfit is in motion. The tractor is ordinarily worked in second speed, making it possible to cover between 25 and 30 miles per 10-hour day. The grader has a 7-foot blade which can be extended to 8½ feet or even 10 feet where light maintenance work is handled. The outfit can be turned in 21 feet, which is the turning space required for the tractor itself. The wheel-base, between the grader axle and the rear axle of the tractor, is approximately 13 feet.

The Gilbert Universal road machine, made by the Gilbert Manufacturing Company, Aberdeen, S. Dak., is a one-man grader with scarifier attachment which may be quickly mounted on a standard Fordson tractor with suitable crawler attachment to give adequate traction. The front wheels of the grader and the front wheels of the tractor are arranged so as to steer together from the Fordson steering wheel. Steering all four wheels instead of two minimizes the tendency to skid on a heavy pull, so that it is possible to move more dirt and still keep in a straight line. This machine is equipped with a cab to protect the operator from the sun or from storms when it is used in the winter as a snow removal machine. The wheel-base is 15 feet 10 inches, this being particularly advantageous in wiping out series of bumps or hollows in roads.

The Little Winner road grader made by the Good Roads Machinery Company, Kennett Square, Pa., has been made available for use with a Fordson tractor by a special attachment which gives one man control of both the tractor and the grader. The grader is a machine of all-steel construction, weighing 1,590 pounds and with a scraper blade 6 feet long. With the new attachment, the operator sits in the seat at the rear of the grader and has complete control of the tractor and grader.

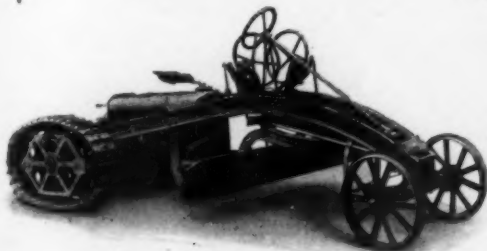
The H-P one-man grader equipped with rigid rail tracks is made by the Hadfield-Penfield Steel Company, Bucyrus, Ohio. This grader, which is used not only for grading but for ditching, road patrol, snow removal and other road work, is so constructed as to make it possible to apply a 1-ton weight on the blade of the grader when it is necessary to cut hard spots in the road surface, without taking the weight from the traction wheels. The grader blade can be tilted and angled to any desired position by the operator without moving from the grader platform. The method by which this universal grader is applied to the Fordson tractor puts 1,200 pounds of weight on the front axle. With loaded rubber wheel equipment the unit weighs 3½ tons. The speed desired by the operator is maintained by the governor, so that the operator has only the gear-shift and clutch to manage, both of which are conveniently handled from the platform and from the seat of the tractor. When the grader is used for the maintenance of hard gravel or stone roads or for city or municipal work, rubber wheels are used which give the unit the speed required for traveling from place to place. When contractors are using it on heavy grading, as in the construction of new roads or subdivision work, the standard wheels may be used, or for greater traction the H-P rigid rail tracks are used. In working between concrete road forms the grader keeps the road level when cut up with trucks and will cut down the hard high spots in the road, thus sav-



LITTLE WINNER ROAD GRADER WITH FORDSON ATTACHMENT

ing many men, as it is handled as readily backing up as it is going ahead, a distinct advantage under many conditions.

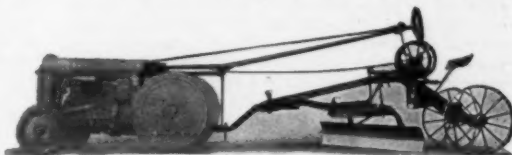
A one-man Patrol grader, and a light-weight grader and a road planer, each requiring two men for operation with the Fordson tractor, are made by the Russell Grader Manufacturing Company, Minneapolis, Minn. The Russell one-man Hi-Way patrol consists of a light blade grader and attachment for a Fordson tractor, enabling one man in the seat of the grader to easily control the tractor as well as to operate the grader. The grader is equipped with a 6-foot or 8-foot blade, has adjustable lifting links, a long wheel-base, and a seat mounted on a flexible spring. The Russell Junior for light road construction and maintenance requires two men for operation, one for the tractor and the other for the grader. When two men are used, an engine steering pole is recommended so that the operator can control the grader from the rear platform. For those who prefer to use one man for both grader and tractor, the Russell Fordson steering device may be applied. In this case, the front truck of the Junior grader is eliminated and the frame is hooked directly to the tractor. This grader is equipped with a 6-foot blade made of plow steel and equipped with a detachable cutting edge. The blade has a side shift of 16 inches, which permits shifting the blade to either side for ditch work or for setting the blade in position for delivering dirt inside or outside the rear wheels. The Russell road planer, a Fordson unit, with a 12-foot blade, is used for maintaining gravel, sand, clay or macadam roads.



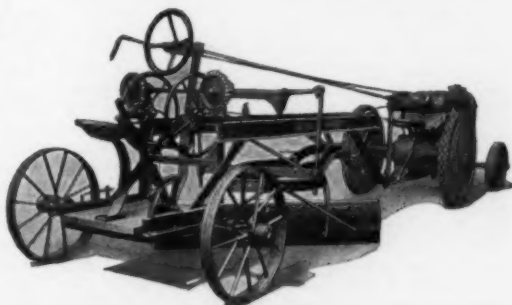
H-P GRADER ATTACHED TO TRACTOR

Two men are recommended for use with this machine, one on the tractor, and the other to operate the planer. When two men are operating, the adjustable steering pole is recommended, so that the grader can be controlled from the rear platform. A stub engine pole is furnished when one man operates both the tractor and the grader or when a short hook-up is advantageous. The road planer with a 12-foot blade makes it a medium-size machine, adaptable to a large range of work. The cutting edge of the blade is of high carbon steel made in two parts, 5/16-inch thick.

A one-man grader designed to meet the requirements of city, street and county road maintenance and also for finishing work and light grading for contractors, has been developed by the Wehr Company, 533-545 Thirtieth Street, Milwaukee, Wis. This machine is heavily



THE RUSSELL-FORDSON HI-WAY PATROL



THE RUSSELL JUNIOR GRADER FOR ONE-MAN OPERATION

constructed and utilizes the Fordson tractor as the power unit. The grader is made with a heavy steel channel frame carrying a 6-foot blade. The blade can be raised or lowered and tilted at any angle desired by the operator. The tractor is easily controlled by the operator from his position at the middle of the machine. The motor is strung on a 3-point suspension with no unnecessary strain put on the power unit. This construction makes possible the full application of the power unit direct to the cutting blades, utilizing the weight of the power unit itself to hold the grader steady on the road when working.

A Tractor Track

A motor chassis on which a contractor may mount his Fordson tractor power-plant by simply removing it from the wheels of his tractor, has been developed by the Top-



THE RUSSELL-FORDSON ROAD PLANER WITH 12-FOOT BLADE

pins Tractor Truck Company, Inc., Chicago, Ill. It is claimed that with a common hoisting device between the tractor and the truck chassis, it is possible to transfer the power-plant of the tractor to the truck unit in as short a time as would be required to have a team of horses taken care of and harnessed. The Model "K" contractor's special is designed for use where converting the power-plant for tractor and truck use will not be necessary often, and makes a truck able to handle loads from 2 to $3\frac{1}{2}$ tons. This model has a short wheel-base and is particularly useful for the road contractor who desires a two-batch dump body. The Model "L" carries from $3\frac{1}{2}$ to 6 tons per trip. This model has eight speeds forward and two reverse and is capable of handling its maximum load capacity under extreme working conditions with ease.

Traction Ditching Machine

A light-weight traction ditching machine mounted on a Fordson tractor is made by the Chas. T. Topping Machinery Company, Box 842, Dayton, Ohio. This machine is adapted for excavating ditches for pipe lines, road construction, farm drainage, small sewers and irrigation. It excavates a ditch from 0 to 4 feet deep, and 12 to 22 inches wide. The digging speed is 120 feet to 1,800 feet per hour. The machine can be transported in a motor truck, as it measures only 16 feet over-all, 7 feet 3 inches wide, and has a wheel-base of $92\frac{1}{2}$ inches. It may be quickly converted from a ditching machine to a standard tractor. The digging machine is equipped with a safety spring draw-bar connected to the digging boom. The excavator boom may be shifted to dig in the center or on either side, and the soil is delivered uniformly to the left-hand side of the trench.

Dump Bodies

An automatic flat-type gravity-dump body for Ford 1-ton trucks, known as No. 2510, is built by the American Production and Trading Company, 4801 South Morgan Street, Chicago, Ill. The center of gravity of the load with this body is low and well forward of the rear axle. The body has a double-acting tail-gate, double spring check chain, double positive-locking latches, and rolling dogs. The body, which is made of steel, dumps to an angle of 45 degrees and measures 6 x 4 feet x 14 inches. With this body the load dumps the body, and when empty it may be returned to normal position and automatically locked by one man. To divide the load in the batch for batch mix an extra partition is added. With this equipment a stiff leg is necessary and each batch can be re-

leased separately with the body held in dumping position. The stiff leg and adjustable end-gate make the body adaptable for spreading loose material.

The Anthony automatic heavy-duty rocker body, made by the Anthony Company, Streator, Ill., is now mounted on a semi-trailer made by the Hesse Manufacturing Company, and is used with the Fordson tractor by contractors. This combination has been brought about by the fact that individual Anthony bodies have been used on several chassis, wearing them out, because concrete road building is a truck-killing job. The frames of the dump body terminate ahead of the rear axle of the semi-trailer, permitting proper action of the body and giving an unusual weight distribution when the loaded body is in the horizontal position. More than 25 per cent of the live load of the body is carried forward on the tractor, lessening the necessity of weighting the tractor wheels to increase tractive effort. The body has a $2\frac{1}{2}$ -yard capacity, carrying more than 3 tons of gravel. Rocking frame dump bodies having a capacity of 38 cubic feet water-level with an 18-inch clearance when tipped to an angle of 45 degrees and with an inside box measurement of 70 by 50 by 19 inches, are also made by the Anthony Company, as well as other smaller bodies of somewhat similar construction.

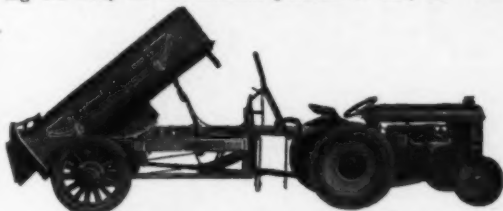
The Archer 1-yard body with 1-ton hoist for Ford trucks is made by the Archer Iron Works, Chicago, Ill. With this hoist, the body can be elevated to an angle of over 45 degrees, permitting a free discharge of the material. The body can be returned to the normal position by gravity in 5 to 10 seconds. The equipment recommended for use on Ford 1-ton trucks is the 1-yard body, which can be raised to the dumping angle of 45 degrees in 30 seconds and which measures 7 feet long, 3 feet 8 inches wide, and 1 foot 2 inches deep. The bodies are made of heavy gage steel strongly reinforced to withstand the severest usage. The manufacturers claim to have eliminated all complicated parts in the construction of the hoist and bodies to insure as great efficiency as possible in the operation of the truck.

Eagle No. 62-A dump-bodies are made by the Eagle Wagon Works, Auburn, N. Y., for Ford 1-ton trucks. This contractor's type body has a swinging center partition so that two $\frac{1}{2}$ -yard or two $\frac{1}{3}$ -yard batches can be carried in a load and each batch kept separately and dumped separately. This steel body is also equipped with subsills which are 6 inches higher than usual, so that



AN AMERICAN AUTOMATIC FLAT-TYPE GRAVITY BODY

the load fully clears in the dump. The Eagle body dumping equipment has a hold-up mechanism so that when the body is used to carry two batches, dumping one batch at a time, the hold-up mechanism can be thrown out by shifting the lever, which raises or lowers the bar, exposing the piece which engages the hold-up mechanism, and keeping the body in the inclined position or not, as



AN ANTHONY SEMI-TRAILER DUMP BODY

desired.

Junior mono-metallic bodies and Columbian lightning hand hoists for Ford trucks are made by the Columbian Steel Tank Company, 1405-1625 West 12th Street, Kansas City, Mo. These dump bodies are made up of a floor member, two side members, the front end member and the tail-gate. All except the tail-gate are electrically welded into one metallic unit. Extremely strong reinforcement is welded around the top and at the rear to take care of wear and tear. A gravity-dump body of the hopper type is also similarly constructed, giving a dumping angle of 80 degrees. The body when tripped falls back to its dumping position and is stopped by heavy control springs and a chain attached to the top of the front of the body and to the chassis or subsills. A similar control chain and springs operate at the rear when the body is pulled back into position, and the two maintain a tight tension when the load is being transported or the truck is running empty.

A single body which combines the features of a self-operating dump body of the gravity type, an express body, and, with a simple extra attachment, a lift and lock dump body with all hoist type features for use on Ford 1-ton trucks, has been developed by the Griscom-Russell Company, 90 West Street, New York City. The "Jiffy" gravity operation is quick, making it possible to dump the body and return it with the

truck in motion. The automatic tail-gate can be set to dump the load in a pile or spread it as desired, or can be adjusted to swing downward when the body is used as an express body. This body has a capacity of $1\frac{1}{4}$ cubic yards and weighs 700 pounds. The bottom and sides are made in one piece, without seams, and the heavy channel-iron sub-frame is electrically welded to the body.

No rivets and bolts are used in the construction of the body.

A Roll-Over steel dump body for Ford 1-ton trucks is made by the Easton Car & Construction Company, Easton, Pa. The body is built specially for handling dry aggregate or wet mix. It is made of blue annealed boiler plate, and the top edge is strengthened by breaking the plate and rolling it over twice, giving the body rigidity and additional strength. The frame supporting the body is of all-steel construction and is so designed that it adds strength to the truck frame and properly distributes the weight of the loaded body, absorbing the shock of dumping the body, thus relieving the truck frame of this strain. In dumping, the body rolls throughout the entire angle of dump. It is



EAGLE BODY FOR FORD 1-TON TRUCKS

claimed that drivers quickly get the knack of righting the body as they drive away from the mixer, without stopping or taking a hand from the steering wheel. The body is made in $\frac{3}{4}$ -, 1-,

and $1\frac{1}{4}$ -yard sizes, weighing 675, 700 and 750 pounds, respectively.

Gammon dump bodies are made for end dumping and side dumping, by the Pechstein Iron Works, Keokuk, Iowa. The end-dump body for Ford trucks is built in $\frac{3}{4}$ - and 1-yard capacities. When this rear-dump body is loaded in its hauling position, the load is carried on the entire frame, distributed well over the whole chassis. It is mounted low, enabling the driver to see to the rear readily when necessary. In dumping, the box travels to the rear on rollers, and when the rear rollers drop off the frame, the weight is taken up by two trunnions on a shaft on which the box is balanced. The dump body may



THE ARCHER HAND-DUMPED TRUCK BODY



THE GRISCO-RUSSELL DUMP BODY IN ACTION

be readily removed from the frame, and at small expense a platform can be built onto the frame, making it possible to use the truck for other work. The Gammon side-dump body is similar in construction to the end-dump body and is used to handle batches of aggregate and cement, dumping directly into the mixer skip. Each box holds enough sand and gravel for a 3-sack batch mixture. The bodies dump to either side and clear of the wheel-base.

A rocker-type gravity-dump body for a 1-ton Ford chassis is made by the Heil Company, Milwaukee, Wis. This Rocker Dump-Quick body has a capacity of 1 yard, which may be increased by adding extra sides. The body is 5 feet 6 inches in length, 3 feet 10½ inches and 4 feet 1½ inches tapered in width, and 14¾ inches in height. The tail-gate ground clearance when dumped is 20 inches. There is a positive catch on the operating lever. When this catch is released, the body rolls quickly back on the rocker cradle to the full dumping position, where it is held by a stiff-leg locking bar. This stiff-leg does not depend on gravity or the momentum of the body to be thrown in a locked position, but is actuated by a connection to the body. This connection keeps the stiff-leg from recoiling and will prevent the body from unexpectedly dropping back to the chassis frame. The tail-gate is thrown wide open automatically. To bring the body down into position again, the operating lever is again pulled, and the chain connected to it disengages the stiff-leg locking bar. On each side of the body are "hold-down" bars, which prevent the body from bumping up and down on uneven roads and from swaying from side to side when the truck is moving at a rapid speed.



A HEIL ROCKER-TYPE DUMP-QUICK BODY

An interchangeable dump-express body which can be used either with an automatic gravity, quick-acting vertical hoist or with an under-body hoist has been developed for use on Ford 1-ton trucks by The Hughes-Keenan Company, Inc., Mansfield, Ohio. The same body is used for gravity dumping or with either type of hoist. Bodies are made in two sizes, either 1 or 1½ yards capacity. The approximate weight of either body with gravity sub-frame is 750 pounds; with vertical hoist, 720 pounds, and with the under-body hoist, 780 pounds. The dumping angle with the gravity sub-frame or vertical hoist is 45 degrees, and with the under-body hoist 50 degrees. The bodies are made of No. 10 gage steel, heavily reinforced. Special steel side boards and dividing partitions can be secured for these bodies.



A HUGHES-KEENAN DUMP BODY

The Jennings dump body for Ford trucks, made by the Jennings Automatic Dump Body Company, 828 Third Street, S. E., Roanoke, Va., is built for gravity dumping and is controlled by patented levers which enable the operator to dump the load instantly and positively without jarring the truck. By throwing the lever from the vertical to the horizontal position, the automatic tail-gate opens and the body is forced to the dumping position. This can be done without the driver's leaving the seat. These bodies are made of No. 11 gage ¾-inch open-hearth blue-annealed sheet steel with all laps leaded before hot riveting. The rivets in the bottom are countersunk. The body is made in square corners and bottom edges, enabling brick, crates or barrels to be handled as easily as in an ordinary express body. These bodies are made in 1-yard capacity water-level for general contract use, and are made so that they can take sideboards to increase the capacity if necessary.

The Lee-4D all-purpose body made by the Lee Trailer and Body Company, 2343 South La Salle Street, Chicago, Ill., has a capacity of 1 cubic yard when level full, and 2 cubic yards crowned. The body measures 6 feet long, 4 feet wide inside, and 1 foot 2 inches deep. No. 10 gage metal is used for the body, which has a dumping angle of



A LEE 4-D DUMP BODY

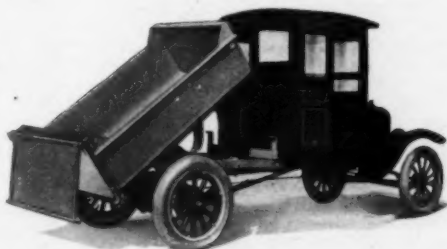
45 degrees. The end-gate is double-acting. This body dumps easily, putting no excessive strain on the chassis, and dumps without power by releasing the latch. The Lee hopper-type-automatic end-dump body is adaptable for handling wet mix and asphalt. In charging a concrete mixer, it throws all the material well forward into the skip without spilling the load near the edge. This body has a long roll, meaning that the center of gravity is well forward of the rear axle, giving a good load distribution. Large, heavy flanges along the rolling surfaces prevent shifting sideways, both in carrying and in dumping.

A combination steel dump and platform body for Ford trucks is made by the Mandt Company, Keokuk, Iowa. Contractors use it for general dump work, or by dropping the tail-gate to haul forms of lumber or by removing the sides to handle cement, stone or machinery. This body has a capacity of 1 cubic yard and is made of 10 and 12 gage steel on the bottom and sides respectively. The length of the body with the gate up is 66 inches, and with the gate down, 86 inches. It is 48 inches wide and 16 inches deep. The body comes ready to clamp on the chassis, no machine work being necessary to attach it. The Road-builders Special Automatic Dump Scoop Hopper made by this same company is a round-cornered, self-dumping body which is concrete-tight. It dumps at a 70-degree pitch on the main body. There are no tail-gates or moving parts. It overcomes the top-heaviness of the old hopper body and is made to haul dry or wet aggregate. It has a capacity of 1 cubic yard, is made of 12 gage steel plate, 72 inches long, 16 inches deep, and 54 inches at the extreme width.

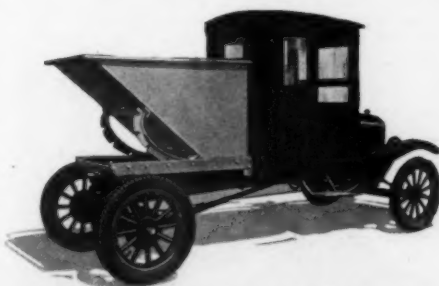
A very general line of steel dump bodies is made by the Martin-Parry Corporation, York, Pa. The five different all-steel models include hand-dumping and gravity-dumping bodies. Body 350, which has a length of 72 inches, a width of 45½ inches, and sides 18 inches high, has a capacity of 35 cubic feet and a net weight of 710 pounds. The body is made of two pieces of 10-gage steel, electrically welded, giving a flat, smooth inner surface with rounded corners. The dumping mechanism is said to be five times stronger than necessary to handle an ordinary load. With the new hoist, which is geared 65 to 1, the body is placed 14 inches closer to the cab, giving greater dumping clearance and distributing the load more



A MARTIN-PARRY HOIST-OPERATED DUMP BODY WITH OPEN CABIN AND TAIL-GATE THAT OPENS FROM TOP OR BOTTOM



GRAVITY-OPERATED DUMP BODY WITH AUTOMATIC TAIL-GATE



ROCKER TYPE GRAVITY-OPERATED DUMP BODY

evenly over the entire chassis. Body No. 351 is the same as 350, except that it has a gravity dump mounted on rollers. Body No. 353 is a medium-size body of the hatch type having a capacity of 30 cubic feet. It dumps when the catch which holds the body is released, the body rolling backward, dumping the load instantaneously. The body then returns to the load position and locks automatically. This body must be loaded at least three-quarters full to insure satisfactory operating results.

Crooke truck bodies for 1-ton Ford truck chassis are made by the New York Central Iron Works Company, Inc., Hagerstown, Md., measure 72 by 44 by 20 inches, and hold 36½ cubic feet. The body is made of No. 10 steel plate reinforced with 1½ by 1½ by 3/16-inch angles of welded and riveted construction. The load is dumped by

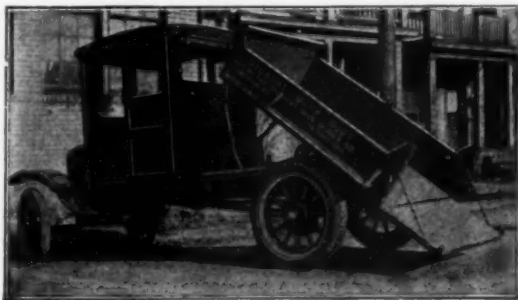


THE CROCKE DUMP BODY FOR A 1-TON CHASSIS

a crank which may be used on either side of the body for operating the dumping shaft; two revolutions of the crank will completely dump the load. The shaft is carried on bearings attached to the truck body and is fitted with specially designed pinions running in self-cleaning spider racks which are kept in proper mesh by carrier rollers running in guides. The extreme dumping angle of the body is about 45 degrees. The automatic tail-gate is raised as the body reaches its full dumping position. There are no latches on the gate, and upon the return of the body to its normal position, the gate closes and the body is ready for reloading. A gravity-dump body is also manufactured, and the express style dumps with the load and returns to loading position unassisted by either truck motion or

no chains or springs to rattle, thus making it a sturdy piece of construction. The body, which is made of No. 10 gage steel in one piece, has a length of 72 inches and a width of 48 inches and is 15 inches deep. The loading height from the ground is 49 inches, and the weight of the body complete, with all castings, is 600 pounds. The tail-gate remains locked until the body is about half-way to its full dumping position, when it opens automatically. The body is equipped with a mechanical locking device which holds it in dumping position until it is released by the driver by a slight push backwards on the same lever that dumps the body.

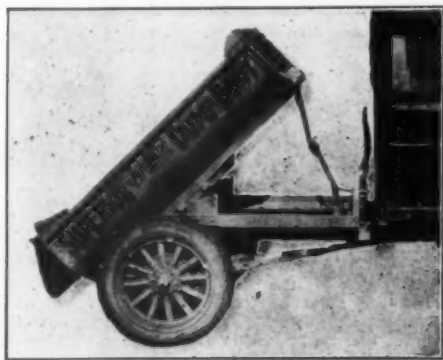
A gravity-dump body for 1-ton Ford trucks with a capacity of 1 cubic yard and dumped by a lever



STEWART AUTOMATIC DUMP BODY WITH TAIL-GATE EXTENDED

from the driver's seat is made by the Stewart Iron Works Company, Cincinnati, Ohio. The same lever that dumps the body returns it to place. The driver does not have to leave his seat. The tail-gate opens automatically when the body is dumped and closes automatically as the body is returned. The loading edge of the body when mounted on a Ford chassis is 47 inches from the ground. The body has a dumping angle of 45 degrees and is made of No. 10 gage sheet steel.

Hand hoist and steel dump bodies for mounting on a Ford 1-ton truck are made by the Van Dorn Iron Works Company, Cleveland, Ohio. The body is well built of steel throughout and is reinforced to withstand hard usage. It has a double-acting tail-gate. The hand hoist for dumping can take care of loads up to 2 tons. It is built of structural steel and is so compactly con-



THE SELF-DUMPING TWO-FULCRUM BODY OF THE SUPERIOR BOILER WORKS

by hand. This body is complete with tail-gate hinged top and bottom for express purposes, dumping or spread, and includes necessary bolts for mounting.

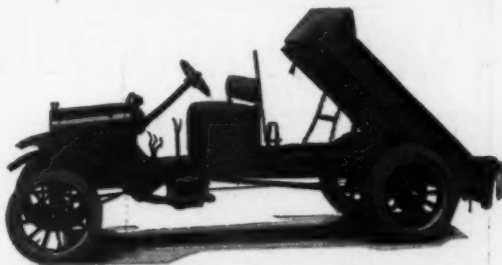
The Superior automatic dump body, which has a water-level capacity of $1\frac{3}{4}$ yards, and is made by the Superior Boiler Works, Marion, Ind., for mounting on Fordson 1-ton trucks, has two fulcrums which permit the body to dump itself as soon as the latch is thrown, and returns to its original position after the load is dumped, without any undue racking of the body. There are



THE VAN DORN STEEL DUMP BODY AND HAND HOIST

structed as to occupy only 9 inches at the rear of the driver's seat. It is designed with a sub-frame 6 inches wide with bolt holes for attaching to the chassis. The body can be elevated by hand from either side and held at any dumping angle up to 45 degrees. The worm and gear mechanism is irreversible, so there is no danger of the body's lowering should the crank be removed with the body elevated.

Wood self-dumping steel bodies for Ford trucks are made by the Wood Hydraulic Hoist and Body Company, Detroit, Mich. This self-dumper operates by gravity, requiring no hoist of any kind, and is controlled entirely from the driver's seat. The double-acting tail-gate is automatic when dumping, hinged at the top, swinging out at the bottom. As the body tilts, the center of gravity moves backward and a second pivot behind the first comes into use so that the speed of the body is sufficiently slowed down to prevent the racking action which occurs in many gravity-operated



A WOOD SELF-DUMPER

bodies. The stop chains are provided with a heavy spring, and check the body without shock when it reaches the proper angle. The inside dimensions of the body are 78 by 48 by 12½ inches over all, and the loading height is 53¼ inches. The body is of 1-cubic-yard capacity and built of 10-gage steel throughout, with all seams and castings hot-riveted.

An Efficient Gravel Plant

AT Rimrock, Wash., where the Department of the Interior is constructing an enormous earth and rock fill dam with concrete core, to supplement the supply of storage water for the Yakima project, an interesting feature of the construction layout is the gravel-screening plant. Advantage was taken of the topography by locating the plant surmounted by a high cableway tower at the center of a semi-circular arc described by the river in its course. The gravel is picked up from the bed and edge of the stream by a bucket suspended and operated along a cableway, one end of which is at the center of the tower and the other end attached to a tree across the river, and which can be moved whenever conditions warrant. The gravel is dumped into a hopper at the top of the tower and is screened

and washed in the same process as it descends by gravity.

F. T. Crowe, the construction engineer, who has had much experience along this line, states that this is the most efficient and satisfactory gravel plant he has ever operated. It will excavate, screen, crush, and wash approximately 400 yards per 8-hour shift with a crew of 3 men; 4-yard cars can be loaded from under the bins at the rate of one per minute by the brakeman on the train that conveys the material to the mixer.

One of the advantages is that every considerable rise in the river refills the excavated portion of the gravel beds, so that the plant might be operated indefinitely, and will, in fact, be operated several years from the same position.

—Pacific Builder and Engineer.

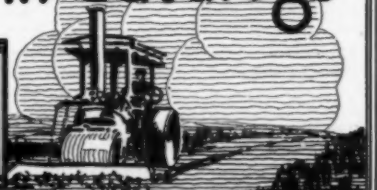


A PORTION OF THE WALLACE & TIERNAN ORGANIZATION AT NEWARK, N. J., GROUPED ABOUT A SHIPMENT OF 35 VACUUM TYPE CHLORINATORS

This shipment was sent the latter part of June to the Water Department of the city of Chicago to increase the chlorinating capacity of all of the Department's pumping-stations. This is the largest shipment of chlorine control apparatus that has ever been made and constitutes a record in that the shipment was executed in 18 working days, after the Commissioner of Public Works of Chicago had authorized the manufacturer to proceed

Worthwhile Data in Catalogs

The catalogs and pamphlets listed below are available for free distribution. Contractors and Engineers who check over these pages each month and write for such material as interests them, will find this a valuable means of keeping up to date on the subject of machinery and equipment.



COMPLETE ASPHALT PLANTS

Full information regarding the Merriman one-car steam asphalt plant with a guaranteed capacity of 2,250 yards per day and the Mosher steam melting two-unit portable road plant with a capacity of 1,800 yards per day, will be found in the literature of the East Iron & Machine Co., Lima, Ohio.

MOVING DIRT FOR LESS MONEY

A five-scraper train of Model T, Baker-Maney scrapers is moving 50 to 600 yards of dirt per day with only three men. Catalog No. 209 issued by the Baker Mfg. Co., 585 Stanford Ave., Springfield, Ill., describes in detail these self-loading scrapers, which can be loaded and hauled by heavy tractors.

METAL FORMS FOR CIRCULAR CONCRETE WORK

The Metal Forms Corp., Milwaukee, Wis., has issued a worth-while 28-page illustrated booklet, "Metaform—Interlocking Steel Forms for Circular Concrete Work," which contains interesting information on all types of circular concrete construction.

"DAYLIGHT" BUILDINGS

Industrial engineers and others interested in securing the maximum light in industrial buildings should communicate with The Ballinger Co., 12th and Chestnut St., Philadelphia, Pa., and secure a copy of "Buildings for Commerce and Industry," describing "Daylight" buildings and the economies and advantages of this type of building construction.

CONCRETE FORM CLAMPS

The Universal Form Clamp Co. has issued a particularly helpful 45-page illustrated booklet on form clamps and bar spacers, showing various uses of this necessary concrete equipment and containing tables, making it possible to very quickly design column forms for all sizes and heights of columns, as well as walls.

A WORTH-WHILE WYE LEVEL

The "Sterling" engineers' wye level, which has been used to secure the record results in the building of the Delaware River bridge between Philadelphia, Pa., and Camden, N. J., is described in detail in a folder which may be secured from Warren-Knight Co., 136 No. 12th St., Philadelphia, Pa.

DRIVING SHEET-STEEL PILING

In Bulletin 325 recently issued by the Walter A. Zeinicker Supply Co., St. Louis, Mo., contractors will find an attractive listing of sheet-steel piling and pile-driving hammers of the steam and drop type.

SINGLE, DOUBLE AND TRIPLE-DRUM HOISTS

Catalog No. 24 recently issued by the O. K. Clutch & Machinery Co., Columbia, Pa., describes in detail this company's complete line of hoisting machines made in single, double- and triple-drum types, both reversible and non-reversible, for gasoline, belt or electric drives.

TWO-CYLINDER POWER-PLANTS

The Turner & Moore Mfg. Co., 4660 Merritt Ave., Detroit, Mich., has issued a folder describing Turmo two-cylinder power-plants, which have many advantages in contracting service.

WIRE LATH FOR PLASTERING

The value of Clinton wire lath, which forms a plaster key as well as a reinforcement for the plaster, is described in detail in literature which may be secured from the Wickwire Spencer Steel Co., 41 East 42nd St., New York City.

POWERFUL MOTOR TRUCKS

Excavating jobs prove the worth of any motor truck because they are required to stand rough going in excavations and make the ramp. The value of GMC 2-range transmission in this kind of work is described in literature which may be secured from the General Motor Truck Co., Dept. 49, Pontiac, Mich.

TIME-TESTED TRANSMISSIONS

The Warford auxiliary transmission for Ford trucks, made by the Warford Corporation, 44 Whitehall St., New York City, has shown its qualities in the fact that a single transmission has outlived two sturdy Ford trucks and is to-day giving 2-ton capacity and speed-wagon pace on a third. This transmission is described in detail in the free illustrated literature of the Warford Corporation.

A TRAILER FOR GRADING WORK

An Easton trailer with Roll-Over body which takes the place of six horses and reduces the number of men from three to one for an equal amount of work, is described in the literature of the Easton Car & Construction Co., Easton, Pa.

QUICK-DUMPING 1-TON TRUCK BODIES

Bulletin 138 issued by the Heil Co., 1130-50 Montana Ave., Milwaukee, Wis., describes the Heil Dump-Quick body. Bulletin 133 describes the Hopper gravity, underneath hand-hoist, gravel body and the hinged side bodies made by this company.

AN ALL-PURPOSE STEEL DUMP BODY

The Stewart Iron Works Co., Cincinnati, Ohio, will be pleased to send its literature describing the Stewart all-purpose steel body, which is a quick-acting self-dumper requiring no hoist, operates from the driver's seat, and is shipped ready to mount on a Ford chassis.

TRACTORS WITH LOW UP-KEEP

Complete information as to how the Fordson tractor can be used to advantage in different classes of contracting work may be secured from the Ford Motor Co., Detroit, Mich.

THE NEWEST WHEELED SCRAPER

A new catalog, No. 209, has been issued by the Baker Mfg. Co., 585 Stanford Ave., Springfield, Ill., describing the newest Maney scraper, which has a capacity of 1 1/4 yards and is built for tough work behind big tractors.

A LOW FIRST-COST EXCAVATOR

Catalog No. 46 issued by the Insley Mfg. Co., Indianapolis, Ind., describes the new Insley excavator which fills the gap between the heavy expensive shovel and hand or team work. This machine is of low first-cost and is used as a shovel with a 1 1/3-yard dipper or as a ditcher with a 1/2-yard bucket, either operated by one man.

SIDE LOADER MODEL MIXERS

The 1924 catalog and price list of the Construction Machinery Co., Waterloo, Iowa, describes the line of Wonder mixers and gives a good idea why the state of Pennsylvania purchased 33 of these machines, the state of New York 23, for road work.

A TEXT-BOOK ON ROCK ASPHALT

The 1924 Kyrock Book C. E. M., issued by the Kentucky Rock Asphalt Co., 711-718 Marion E. Taylor Bldg., Louisville, Ky., is a text-book on how nature makes rock asphalt, how it is mined, crushed and used on the road, furnishing a natural cold laid sheet asphalt.

INDUSTRIAL RAILWAY EQUIPMENT

The bulletin of the Koppel Industrial Car & Equipment Co., Koppel, Pa., describes its well-built, safe, heavy-duty dump-cars for industrial railway use on road construction.

A ONE-MAN ELECTRIC SHOVEL

The power and economy of F & H electrically driven shovels for quarry service and wherever continuous service in heavy going is necessary, is described in a book, "What Users Say," which may be secured from the Excavating Machinery Div., Pawling & Har-nischfeger Co., 3819 National Ave., Milwaukee, Wis.



"Our Hols Have Stood the Most Severe Tests"

Holt has devoted years of research, pioneering and development work in establishing the leadership of the "Caterpillar"* in every branch of engineering, contracting and industrial service. No mere peculiarity of design or mere "selling features" could ever have made the "Caterpillar" what it is today. The host of quantity orders we continually receive from large firms and international buyers, and the numerous repeat orders we receive from our old customers, tell their own story of how the "Caterpillar"

makes good. As stated in a recent letter from Longerbone Brothers, prominent contractors, Des Moines, Iowa—

"No blue print, specification, guaranty or 'sales talk' will make a tractor do anything, or be anything. There is just one test of efficiency: PERFORMANCE. Our Hols have stood the most severe tests."

Our booklet, "Caterpillar" Performance, will interest every contractor, engineer and road official. Still better, we urge you to investigate "Caterpillar" Performance in the field.

THE NATION'S ROADMAKER

* There is but one "Caterpillar"—Holt builds it

THE HOLT MANUFACTURING COMPANY, Inc.

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When writing to advertisers, please mention the Contractors' & Engineers' Monthly—Thank you,

A REASONABLY PRICED CONCRETE MIXER

The complete line of Packard and Boss mixers made by the American Cement Machine Co., Inc., Keokuk, Iowa, is described in literature which tells why 8,000 contractors and engineers are using these fast-discharging mixers.

HIGH-GRADE EXCAVATING MACHINERY

Contractors to whom 50 years' service in the manufacture of quality excavating machinery means everything, should write to the Osgood Co., Marion, Ohio, manufacturers of $\frac{3}{4}$ -, 1- and 1 $\frac{1}{4}$ -yard revolving shovels, clamshells, draglines and cranes on traction wheels or continuous treads, for literature describing the Osgood line of excavating machinery.

A LOCKED METER-BOX

The question, "Is there a difference in meter boxes?" is answered admirably in the literature of the Ford Meter Box Co., Wabash, Ind., which describes not only Ford meter boxes with the worm lock but also other water-works equipment and accessories.

KEEPING ROADS YOUNG

Expansion and contraction cause the wrinkles and cracks in concrete roads which may be their undoing. Proper care in the installation of Carey Elastite expansion joints between abutting slabs greatly increases the life of well-constructed concrete roads. A new booklet describing concrete road construction and protection has just been issued for free distribution by the Philip Carey Co., 9 Wayne Ave., Lockland, Cincinnati, Ohio.

HAND LABOR OR STEAM HAMMERS

Bulletin 31, which describes and illustrates the full line of McKiernan-Terry hammers for all kinds of work up to the heaviest steel and concrete piles, has been issued by the McKiernan-Terry Drill Co., 19 Park Row, New York City, and shows why pile hammers are labor-savers in driving light timber or steel sheetpiles for sewer jobs and small trenches, as well as for the heaviest kind of pile driving.

MOTOR-TRUCK TURNABLES

Blaw-Knox one-man turntables which keep the paver busy, do not obstruct the roadway, operate on any grade, preserve the subgrade, can be easily moved, reduce the backing distance, and make it possible to handle the same concrete road job with fewer trucks, giving greater profits on the job, are described in detail in the literature of the Blaw-Knox Co., 667 Farmer's Bank Bldg., Pittsburgh, Pa.

SMALL MIXERS FOR BIG JOBS

The literature of the Ransome Concrete Machinery Co., 1772 Second St., Dunellen, N. J., tells how Ransome 10-S Bantams have handled big construction jobs for contractors in various parts of the country without shut-down due to mixer trouble.

AN ENGINE THAT NEVER LOAFs

The Climax engine, known as "The Trustworthy Engine," is never a loafer, never a quitter, never a weakling in driving the contractor's equipment to which it furnishes the motive power. The catalog of the Climax Engineering Co., 1 W. 18th St., Clinton, Iowa, describes this engine in detail, as well as listing and picturing a wealth of contracting equipment powered with a Climax.

MOVING MORE MATERIAL

A Best tractor can move 30 per cent more material than eight good teams, according to an Oklahoma contractor who is handling a big grading job. If you want more information about this sturdy piece of machinery, write for the catalog of the C. L. Best Tractor Co., San Leandro, Calif.

A GASOLINE DRAGLINE

A new Koehring gasoline dragline which is equipped with heavy-duty self-cleaning multiple traction, and is made in $\frac{3}{4}$ -yard or 1-yard capacity, is described in detail in catalog DL, and may be secured from the Koehring Co., Milwaukee, Wis.

GREATER POSSIBILITIES IN CONCRETE WORK

The Insley Mfg. Co., Indianapolis, Ind., in its catalog No. 45 describes the complete line of Insley chuting equipment for concrete, which greatly increases the field in which any contractor may operate.

SEVEN DAYS' STRENGTH IN 48 HOURS

Booklet No. 2053 issued by the Solvay Process Co., Wings & Evans, Inc., Sales Div., 40 Rector St., New York City, contains the latest information on the value of Solvay calcium chloride, which waterproofs, strengthens and protects concrete against freezing temperatures and helps it to attain a greater strength in 48 hours than a corresponding mix with plain water attains in 7 days.

MAKES CONCRETE FINISHING EASIER

Abrams double-action finishing tools, which help a man to do a better job finishing a concrete road or sidewalk while standing on his feet than he possibly can do kneeling on a narrow bridge, are described in the catalog of the Abrams Cement Tool Co., 3618 Grand River Ave., Detroit, Mich.

CRUSHERS THAT WORK CONTINUOUSLY

Western-Aurora crushers are never idle, because when the top half opens to grasp new stone the bottom half closes, and vice versa. Catalog No. 44-H describes these crushers completely. If you are interested, get a copy from the Austin-Western Machinery Co., 400 N. Michigan Ave., Chicago, Ill.

ROAD MAINTAINERS AND ROLLERS

The Huber Mfg. Co., 106 Center St., Marion, Ohio, has issued illustrated folders describing Huber 4-cylinder gasoline rollers with air-controlled scarifier, and the Huber steam roller, as well as the Huber one-man road maintainer.

SMALL SHOVELS FOR EXCAVATION

Bulletin No. 103 issued by the Hoar Shovel Co., Inc., Duluth, Minn., describes in detail the mechanism of the Hoar "Baby" shovel and illustrates it at work in various kinds of excavation.

HOW TO INSTALL SAFE STAIR TREADS

The literature of the Norton Co., Worcester, Mass., describes in detail Alundum safety tile and how it should be installed to produce a stairway which is slip-proof.

A COMPOUND THAT MAKES TIGHT SEWER JOINTS

Sewer pipe joints must be tight to prevent infiltration and the entry of fine roots. Literature telling how water-tight joints can be made in tiled sewers may be secured from the Ruberoid Co., 95 Madison Ave., New York City, describing its Ruberoid Pipe Seal.

A NEW, LARGE, POWERFUL SHOVEL

Bulletin 314-CE just issued by the Marion Steam Shovel Co., Marion, Ohio, describes and illustrates the new Model 350 shovel and the new Model 360 dragline equipped for either steam or electricity. This equipment is claimed to be the world's largest and most powerful shovel and dragline.

HOW TO BE A BETTER ROAD BUILDER

In an 8-page, profusely illustrated booklet, "There Is a Definite Reason for Every Road Building Success," which has been issued by the International Motor Co., 25 Broadway, New York City, contractors will find a great deal of information on how they may become more successful in road-building operations.

A NEW HOIST FOR DUMP-TRUCKS

Literature describing the new $\frac{7}{8}$ -ton Van Dorn underbody screw-type hoist for dump-trucks may be secured from the Van Dorn Iron Works Co., Cleveland, Ohio.

LIGHT-WEIGHT PNEUMATIC HAMMERS

Waughammers, Models 93 and 95, which are light-weight sinkers, made of steel and drop-forgings for rock work, are described in detail in a new 16-page bulletin which may be secured gratis by any contractors interested, from the Denver Rock Drill Mfg. Co., Denver, Colo.

A TRACTOR HOIST FOR CONTRACTORS

The Clyde tractor hoist for mounting on a Fordson tractor will handle pile driving, derrick work, structural steel, logs, land clearing and a hundred other uses to which contractors can put a hoist. This hoist is described in detail in literature of the Clyde Iron Works Sales Co., Duluth, Minn.

PORTABLE MACHINE FOR SURFACING CONCRETE

An electric concrete surfacing machine which does away with hand labor in removing board marks and other irregularities from the surface of concrete work is described in detail in literature which may be secured from the Concrete Surfacing Machinery Co., Dept. CEM, 1205 Harrison Ave., Cincinnati, Ohio.

AN OIL-BURNING TOOL HEATER

Contractors in control of asphalt plants or asphalt street repairs will be interested in the illustrated circular issued by the Chaussee Oil Burner Co., W. Beardsley Ave., Elkhart, Ind., describing the Chaussee oil-burning tool heater, which is replacing wood burners because of its economy and efficiency.

A TRAILER SCRAPER UNIT

Contractors will be interested in the Miami-Fordson scraper, which is a trailer unit designed to replace four teams and six men. This machine, in which one man operates both the tractor and the scraper, is described in detail in the literature of the Miami Trailer-Scraper Co., Troy, Ohio.

A HIGH-GRADE MIXER FOR QUICK WORK

The Leach Co., Oshkosh, Wis., formerly the Oshkosh Mfg. Co., will be pleased to send its illustrated descriptive circular covering the Leach-Oshkosh 7-S concrete mixer, which has a capacity per batch of mixed concrete of 7 cubic feet, and an average discharging time of 7 to 8 seconds, and which requires only 7 seconds to elevate the side loader.

A HIGH-POWERED ROAD BUILDER

The Shawnee Road Builder and Maintainer, which can be operated by one man, and which works as a scarifier, Fresno and blade grader, is described in detail in literature which may be secured from the Shaw-Enoch Tractor Co., 2416 University Ave., S. E., Minneapolis, Minn.



Not to do the Work of a Large Shovel, But—

A Crackerjack of an Excavator

For use on the Lighter Classes of Excavation Work

THE INSLEY EXCAVATOR fills the gap between the heavy, expensive shovel and hand or team work. It is a machine of comparatively low first cost, which means that it has a distinct field of operation where a heavy investment in equipment is not warranted. The work which it will do will surprise you.

As a shovel it has a $\frac{1}{3}$ yard dipper, as a ditcher a $\frac{1}{2}$ yard bucket, and being one-man operated it is of low operating cost. While light in weight and easily moved as compared with the larger shovels on the market, it is of staunch construction and can

be depended upon to stand up as well as units selling for two and three times its price.

In making a 9-inch cut on a city paving job the Bryant Paving Company of Waterloo, Iowa, averaged approximately 200 cubic yards per day in good stiff digging.

James Jiles, of Pittsburgh, did away with ten men in loading cars at his sand quarry and states that the machine will pay for itself in four months.

This machine has wonderful possibilities for use on road, sewer, basement excavation or quarry work where a yardage of 200 to 400 cubic yards per day answers the requirements.

INSLEY

CONCRETE PLACING EQUIPMENT
STEEL DERRICKS
BUCKETS AND CARS
EXCAVATING EQUIPMENT

Write for Catalog No. 46

INSLEY MANUFACTURING CO.

Engineers

INDIANAPOLIS

Manufacturers

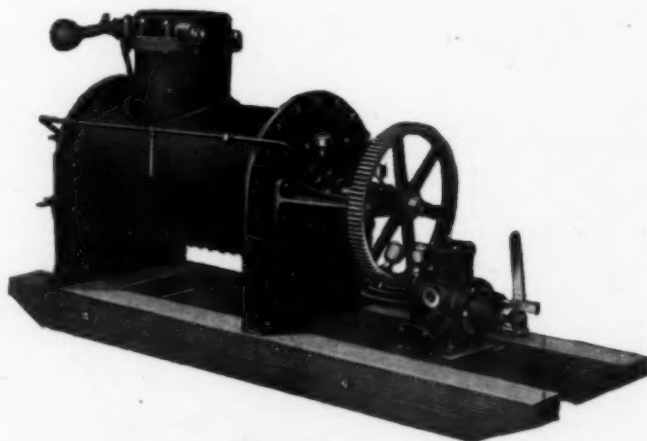
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A Grout Mixer and Ejector

A Positive Type Machine Used by Large Contractors

A GROUT mixer which has a capacity of ejected grout of about 600 bags of aggregate per 8 hours, although in some tunnel work it has run as high as 750 bags, is manufactured by the Union Iron Works, Inc., Hoboken, N. J. Practically all other types of grout mixers depend on the use of air to mix the grout by bubbling. This machine, which is operated by a 3-cylinder air engine, mixes the grout by paddles and then ejects it from the front of the machine by air.

The Union grout mixer and ejector has been used on all the river tunnels in and around New York by such companies as Booth & Flinn, Ltd., the O'Rourke Engineering Company, and the Patrick McGovern Company. The uses of the machine are varied, the principal one being for grouting behind tunnel linings, for lining tunnels through rock, for stopping leaks in tunnels, for stopping leaks in the breastworks of dams, for strengthening and preventing the settlement of footings and foundations, and for grouting between paving blocks. The outfit is furnished by the manufacturer as a complete machine mounted on skids, including a 3-cylinder air engine connected to the mixer and ejector. The mixing drum is 21 inches in diam-



A POSITIVE-ACTION GROUT MIXER

eter by 36 inches long and measures 3 feet 9 inches high from the ground to the top of the charging dome. There are 20 paddles in the drum, which insure complete and thorough mixing of the grout. A 1-inch air inlet is provided, a 3/4-inch water inlet, and a 2-inch grout ejecting outlet. Between 80 and 90 pounds per square inch pressure is required for the operation of the 3-cylinder air engine, which operates at 400 r. p. m. From 125 to 150 cubic feet of free air is necessary for the operation of one outfit at its best speed for most economical and satisfactory work.

A 3/4-Yard Mixer with a 50-Foot Boom

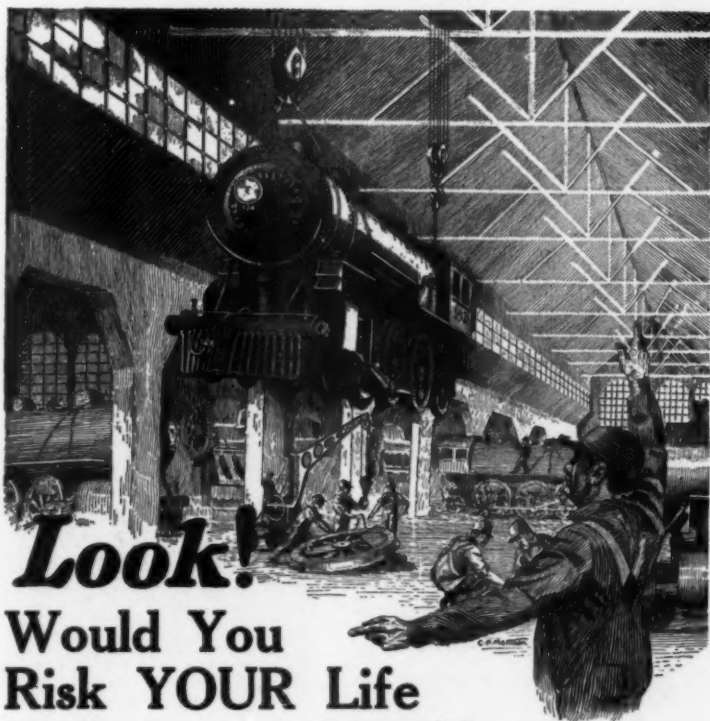
Special Machine Built for Contractors on Great West Road, Isleworth, England

THAT American contractors and manufacturers may have an idea of the nature of the work which is going on in England, we take pleasure in publishing the illustration below, show-

ing a concrete mixer supplied by Stothert & Pitt, Ltd., Bath, England, to John Moffat and Sons, contractors for the construction of the Great West Road at Isleworth, England. This plant consists



CONCRETE MIXER WITH UNUSUALLY LONG SPAN IN PROCESS OF ERECTION BEFORE POURING ROAD



Look!

Would You Risk YOUR Life

with Wire Rope of uncertain grade?



DEMAND Better evidence than this

Why
Ask Others
to Risk Their
Lives?

Don't wait for an accident to accept our warning.

You owe to every employee, the protection WILLIAMSPORT gives to you. You can get this protection in no other ropes, without a laboratory test.

May we send you important, illustrated literature which tells you in an interesting way about our product?

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Main Office and Works:
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of a $\frac{3}{4}$ -yard Victoria mixer with an automatic side loader and an automatic water-tank, direct-coupled to a steam engine and boiler, the latter operating the mixer, the loader and the travel of the skip along the boom.

The distinct feature of this machine, which is being used in the construction of a road 50 feet wide, is that material may be picked up at the side of the road, proportioned, mixed and delivered to any point across the entire width of the road by means of the trussed boom which is supported on both sides of the road. The mixer, which has an unmixed capacity of 21 cubic feet, is said by the contractors to have deposited over

24,000 cubic yards of concrete with only one or two minor repairs. This yardage comprised the first section of the contract.

The mixing plant is mounted on a 4-foot, 8 $\frac{1}{2}$ -inch-gage track, which is laid parallel to the road. The concrete skip is of the turn-over type, which is favored in England for clean and quick discharge. The manufacturers claim that while the boom span of 50 feet covers a much greater area than is possible with the ordinary road paving plant, there is no reason why this span should not be very considerably increased, with a corresponding greater utility and saving in the cost of distributing concrete.

A Larger Size Portable Scraper Unit

A $\frac{3}{4}$ -Yard Outfit Now Available for Sand and Gravel Plants and Contractors

HAVING felt that there was a demand for a portable scraper outfit to be used with the larger portable crushing and screening outfits now on the market, Sauerman Brothers, 438 South Clinton Street, Chicago, Ill., have developed a new $\frac{3}{4}$ -yard outfit, consisting of a $\frac{3}{4}$ -yard Sauerman Crescent scraper bucket, operating cables, guide blocks, bridle anchorage system, and portable hoist. The outfit is furnished with a 35-horse-power Sauerman gasoline hoist, and a 25-horse-power electric hoist or a belt hoist designed for operation by a 25-horse-power electric motor or tractor. When intended for permanent plant installation, the outfit is furnished with the hoist mounted on skids instead of on trucks, to give even greater stability.

Portable scraper outfits have, time and time again, demonstrated their economy. They have greatly reduced the cost of producing sand and gravel for many operators in small commercial plants and for contractors, as well as county and township road commissioners, who utilize local pits



AN EXAMPLE OF HOW HANDY A PORTABLE SCRAPER IS FOR LOADING GRAVEL FROM A PIT ALONGSIDE A HIGHWAY

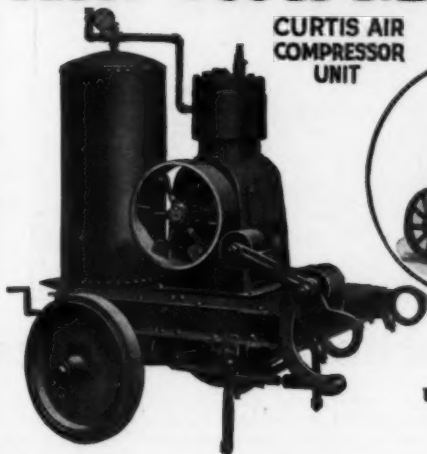


THIS PORTABLE SCRAPER OUTFIT REPLACED SIX MEN SHOVELING ONTO THE CONVEYOR

in connection with their highway construction work. Sauerman portable scraper outfits have also given satisfaction in highway cuts and fills, in digging cellars and in storing and reclaiming gravel, crushed stone, etc.

It is quite easy for an inexperienced man to install and run one of these machines; he quickly becomes skilled in the operation, because all he has to do is handle two levers of a double-drum hoist. These levers control the rotation of the hoist drums which wind and unwind the operating cables, dragging the scraper bucket back and forth over the deposit or pile of material. The scraper bucket, being bottomless, loads and dumps itself when and where wanted, at the will of the operator of the hoist. Material is thus dug and conveyed to any point within the operating span of the machine, usually 200 feet, but the distance can be increased to 300 feet if desired, in a single continuous operation and controlled entirely by one man.

CURTIS-FORDSON AIR COMPRESSOR OUTFIT



CURTIS AIR
COMPRESSOR
UNIT



COMPLETE
OUTFIT

Sold as Complete Outfit or
Unit Can be Bought Separately

Fills A Much Needed Want

Here is just the thing contractors are waiting for—a portable air compressor unit that operates with any Fordson Tractor, making a complete self-contained outfit. Can be used on a hundred different kinds of jobs where a supply of compressed air is temporarily needed. An outfit that can be moved from job to job quickly by its own automotive power—no extra truck for pulling necessary.

50% More Service

The average contractor can easily get 50% more service out of the Curtis Fordson Compressor Outfit than from the ordinary portable compressor outfit, which is heavy, cumbersome, expensive and serves only a single purpose. It must be remembered that the Curtis Fordson has every quality of the ordinary portable compressor outfit plus the advantages of detaching the Fordson Tractor and using it for all tractor purposes.

Wide Range of Uses

The flexibility of the Curtis Fordson Air Compressor Outfit is remarkable—ideal for the road contractor, structural steel field jobs, oil field work, telephone construction, well drilling, etc. Just the thing to supply air for jack hammer drills, paving breakers, riveting hammers, rammers and tampers, compressed air hoists, sand blasts, stone cutting tools, quarry tools, rivet forgers, clay and coal mining diggers, for pumping water, for washing autos and trucks, unloading tank cars, paint spraying, caulking pipe lines, etc. For city streets can be equipped with rubber tires.

Tractor Used Independently

When the Curtis Fordson is not being used as a compressed air outfit, the Fordson Tractor can be detached and used independently for hauling, loading, moving or power-driving purposes. The coupling is simple—nothing to get out of order or misfit. The whole arrangement is sturdy and practical—the Air Compressor Unit can be attached or detached by anyone in a few moments.

Curtis Pneumatic Machinery Co.
1671 Klenlen Ave. St. Louis, Mo.

If You Now Have a Fordson

The Curtis Air Compressor Unit can be purchased separately. Used in connection with a Fordson, it opens new fields of work for the tractor and an additional source of revenue for you. You know the reliability of the Fordson—and you know the reputation and dependability of Curtis Air Compressors. The Curtis Unit is backed by 70 years' manufacturing experience, 27 of which have been devoted to the manufacture of pneumatic machinery, and our \$1,500,000.00 institution. So you take no chances whatever.

Reasonable in Cost

The Curtis Fordson Air Compressor Outfit can be purchased complete, tractor and all, from us, or the Curtis Compressor Unit can be had separately. Mail coupon for full particulars and prices.

1671

Curtis Pneumatic Machinery Co., St. Louis, Mo

Gentlemen: Please send me full information, your proposition and prices on:

☐ Curtis Fordson Air Compressor Outfit Complete

☐ Curtis Air Compressor Unit Only

I am an authorized Ford dealer, I sell . . . cars

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Address

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Brookville Gasoline Locomotives

Ford and Fordson Driven; a finished product made possible by more than six years' manufacturing experience confined exclusively to the manufacture of Ford driven gasoline locomotives.

Fordson Model

Power unit standard Fordson tractor, 100 per cent intact with the exception of removing Fordson wheels and front axle assembly. We offer standard gas locomotive construction and 100 per cent local Fordson service. Standard weights $3\frac{1}{2}$ and 4 tons with draw bar pull of 1750 and 2000 Lbs. Four-wheel-drive with 20" Diameter drivers and $36\frac{1}{2}$ " wheel base. Every Lb. weight carried on spring journals. Regardless as to how crooked or rough the track Brookville will give results.

Ford Ton Truck

Power unit includes the complete Truck chassis, plus patented auxiliary reverse transmission. Standard Ford truck high and low speeds in reverse the same as forward. Standard weights 2 and $2\frac{1}{2}$ tons with 1000 and 1250 Lbs. draw bar pull. Four-wheel-drive, 30" wheel base, with spring journals throughout. For special light work we can furnish in $1\frac{1}{2}$ or even 1 tons weight. Can be used where it is impossible to employ heavy locomotive equipment. Numerous machines of this Model that have been under constant service since 1920 and still rendering satisfactory and economical service.

Bulletin B-1 gives complete details of Fordson.

Bulletin B-4 gives complete details of Ton Truck.

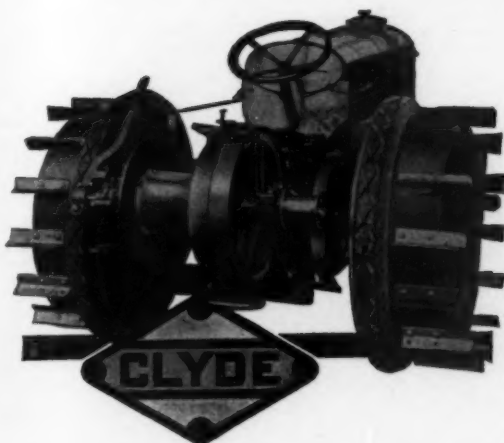
May we submit without obligation?

BROOKVILLE TRUCK & TRACTOR COMPANY
Brookville, Pa., U. S. A.

See both Models on display Ford
 Power Equipment Exposition, Ford
 Motor Company Bldg., New York
 City.

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CLYDE TRACTOR HOIST



FOR THE FORDSON TRACTOR

For Pile Driving
Derrick Work
Structural Steel Handling
Log Loading
Land Clearing
Oil Well Work
Ice and Hay Handling and
a hundred other uses.

Normal Line Pull 4000 lbs. at 175 feet per Minute

The Tractor Hoist consists of a friction drum supported in a cast steel frame mounted on the rear of the tractor. The drum is bronze bushed and runs free on the shaft. The drum is caused to turn with the gear through a double cone-type friction clutch which is controlled by a thrust screw mechanism operated by a hand lever. The drum is equipped with an asbestos-lined band brake operated by a foot lever and also has a ratchet for locking it in any position. A winch head is keyed to the drum shaft extension. Gearing is of steel, with machine cut teeth. The drum bushings are grease cup lubricated. All shaft bearings are babbitted and lubricated with grease cups, the drum shaft bearings being equipped with removable caps. A rod placed on the lever side of the hoist gives the operator full control of the throttle from his regular position.

The hoist frame is fastened to the tractor by eight of the bolts which connect the rear axle housing and the transmission housing and two bolts through the outside holes in the drawbar cap. It is so arranged that the drawbar may be used for hauling without removing any part of the hoist. *No Drilling, tapping, or machine work is required for assembling on the Fordson.*

Power is supplied through a roller chain drive and sprockets from the pulley shaft of the Fordson. (The pulley shaft referred to is shown on page 54 of the Fordson Manual. The belt pulley attachment is not always furnished on the tractor but may be purchased as an extra). The pulley is removed and the chain sprocket installed in its place. *A safety guard protects the operator.*

Cable capacity of drum—600 ft. of $\frac{1}{2}$ in. cable or
375 ft. of $\frac{5}{8}$ in. cable.

Approximate Shipping Weight (including Tool Box)—600 lbs.

A MONKEY WRENCH ATTACHES IT.

Dealers—It multiplies your Fordson Prospects—

Clyde Iron Works Sales Company

DULUTH, MINNESOTA

Sole distributors for Clyde Iron Works

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Fordson Hauls 4½ Tons of Rock Asphalt, 3 Miles—8 Times per Day

Here is a striking example of how dependably and economically Fordson Power is serving contractors and engineers on hauling jobs of every description. In this case it is Rock Asphalt, and the equipment used by the owners, McArthur Construction Co., Kenton, Ohio, consists of two Fordson Tractors and four dump trailers.

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For excavating and general construction work, for road building and maintenance, for transporting supplies, tools and men, in fact, on every kind of an industrial job there is work that Fordson can do at a big saving in time and money.

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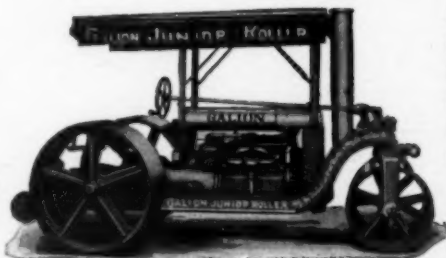
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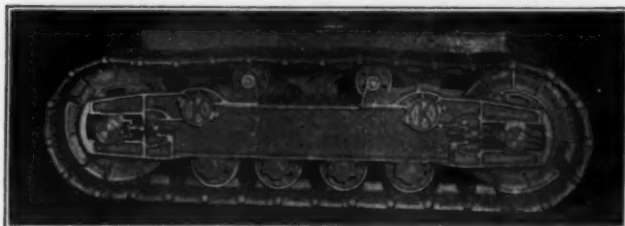
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Dragline Capacities

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A2316—III

LOOK at the smooth top side of the planes—at the construction of the tumblers—all perfectly self-cleaning—and no pockets for stones, gravel or dirt. Planes and links are cast in one piece, high carbon annealed steel, shod with high carbon steel treads. Links extend across entire width of shoes. Shearing or bending strains on links and pins are distributed over nine points between the shoes, practically doing away with the bending and shearing so common to ordinary construction.

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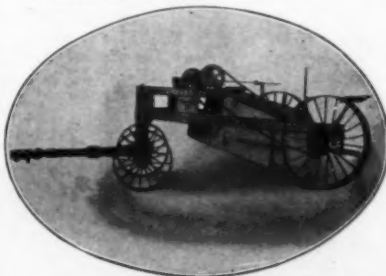
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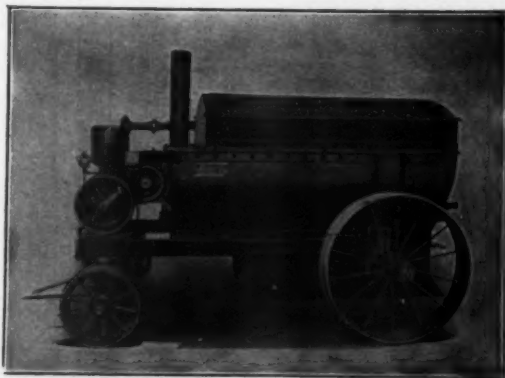


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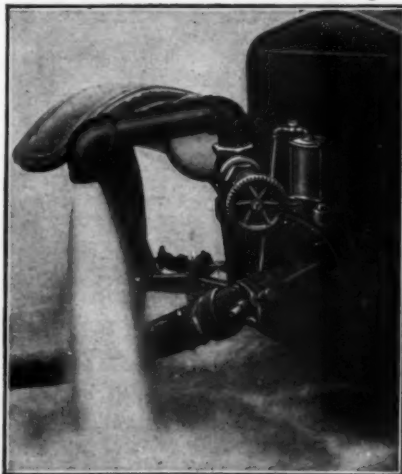
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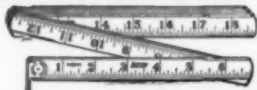
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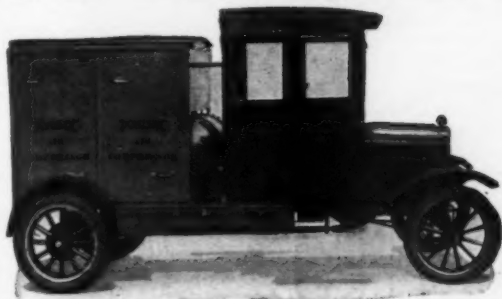
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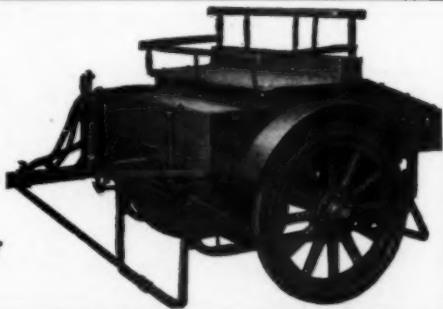
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**WE CARRY 5,000 FINISHED BLADES IN
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Atlas Portable Conveyors

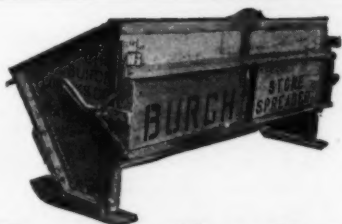
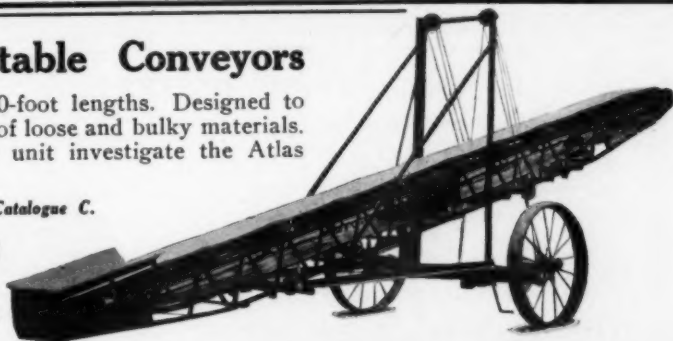
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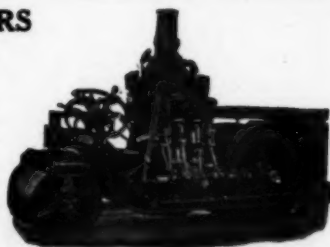
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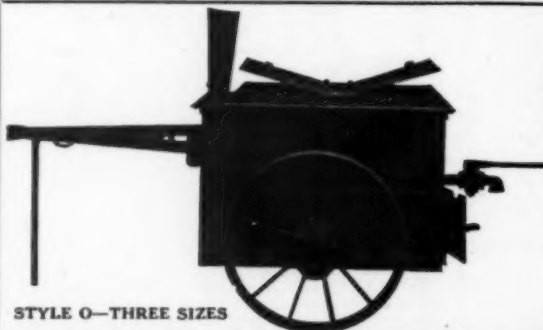
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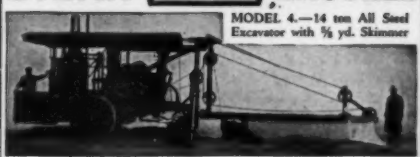
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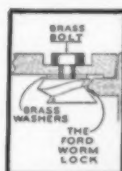


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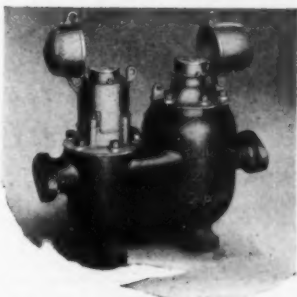
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